

EXCEL 3.0, FREEHAND 3.0, DYNAMAC'S NEW PORTABLES, AND MORE

JULY 1991

\$2.95

MacUser

LIGHTS! MAC! ACTION!

Get the Video Edge!

MacUSER LABS Which video hardware and software works best?

MacUSER LABS GIGABYTES GALORE:
Running on empty?
We test nineteen 1,000-megabyte hard disks

• **SYSTEM 7 ALERT:** Is your software compatible?
82 top packages compared

• **DTP FOR PENNIES:**
Professional pages at bargain prices



The screenshot shows the Microsoft Excel 3.0 interface on a Macintosh. The menu bar includes Apple logo, File, Edit, Formula, Format, Data, and Options. The toolbar contains buttons for font style (Normal), alignment (left, center, right), and calculations (sum, bold, italic). The worksheet displays a pro forma income statement for 'APERTURE' for the year 1991. The data is organized in columns A through D, with rows 1 through 6 visible. The 'Revenue' row is highlighted in red, and the regional breakdown is listed below it.

	A	B	C	D
1	APERTURE Pro Forma Income Statement			
3	Revenue			1991
4	Asia			175,714
5	Australia			87,857
6	Canada			37,653
	Europe			213,367

Introducing Micros



Betsy Mill put it all in perspective when she wrote to us, "I love [Microsoft] Excel as much as my microwave oven but no love is perfect."

Well, Betsy, get a load of this. We think new Microsoft® Excel version 3.0 is the closest thing to perfection ever seen in a spreadsheet for the Mac®. For one good reason.

Power made easy.

The new Toolbar™, for instance, reduces common, time-consuming tasks down to one step.

Highlight a row or column of numbers, hit the Σ button (that's Autosum™),

and *voilà* – it all adds up.

Do quick, push-button formatting. Use outlining features to collapse or expand worksheets without having to create multiple files.

As for charting, we took our cue from Paul Woods of St. Paul, Minnesota, who began his letter with the salutation, "Charts, charts, charts!" Hey, Paul – check out the picture for the full scoop.

Did we mention that you can consolidate up to 255 worksheets at a time, regardless of format?

Or the feature called Goal Seek? Put in the total you want, and Microsoft Excel works backwards from there to fill in the variable you need.

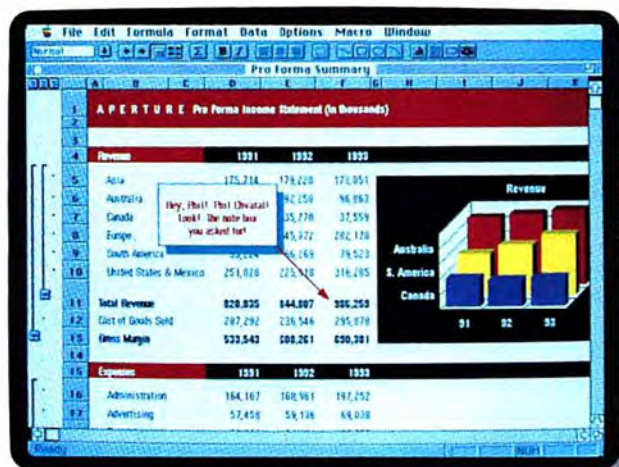
ons Macro Window

Summary

n thousands)

1992	1993	1994	Total
179,228	173,851	208,621	737,414
92,250	96,863	101,706	378,676
35,770	37,559	39,437	150,419
245,372	282,178	324,505	1,065,422

Microsoft Excel version 3.0.



Yes, Paul, you can incorporate any of 68 chart types
(24 of which are 3-D) right into your worksheet, along with text and data.
And notice the outlining feature on the left? Go nuts.

Or the fact that this is the first
System 7.0 application available?
We did fall short in one area, how-

ever, with Ralph Levy's cat. Here in Redmond, we're not very well-versed in how to remove cranky, sharp-clawed felines from atop user manuals.

Let the cat have your old manual, Ralph. You'll get a new one when you update your version of Microsoft Excel for \$129 (or \$50 if you acquired it on or after 12/7/90). Call (800) 541-1261, Dept. Q80, to find out more.

And by the way, Bryan Larson of Mission Viejo, California: we said hi to Bill for you. He sends his regards.

Microsoft
Making it all make sense

We'd like
to respond
to your
suggestions
on how to
improve
Microsoft
Excel.

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

"Collapsing Cells": Collapsing cells would be to a spreadsheet what outlining is to a word processor. A "Collapse" command would allow a number of worksheet cells to essentially disappear and become part of a "header" cell. This would allow the data which underlies a displayed number to be kept in the background, but not (necessarily) shown. For example, this would collapse to this:

The collapsed cells would still exist, but would not be displayed or printed unless an "Expand" command was used. While it is possible to do this today by cutting, moving, and pasting, it would be nice to have this be an automatic feature.

Sincerely,
Michael J. Sullivan
Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

System 7.0 support

Sincerely,
Mark Rice
Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

Integrate a style sheet feature much as that used in MS Word. Sometimes, more often than not, I like a format that has been set up and would like to copy it over, some would have to a new document without recreating the cell style attributes in spreadsheets. Thanks for your ongoing efforts!!!

Elizabeth Fiedler
Durham, N.C.
Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

How about being able to add notes to the spreadsheet that have no effect on the cells. Example 3:

John, this is the magic number in this group of numbers!

Thank
Phil Chantrel
Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

3D CHARTS

Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

One other thing that is odd, Microsoft does not automatically save work within cells. I could do 90% of my work in Microsoft Excel. I'm an extremely worried in the state of the economy. I'm not sure if the system is working or not. I'm not sure if the system is working or not. I'm not sure if the system is working or not.

Hope you're listening,
Mike
Lawrence, CA
Microsoft
Making it all make sense

9 out of 10 Mac spreadsheet users use Microsoft Excel. What are we doing wrong?

Tell us what's on your mind and it could end up on your screen.

Provide capability for what-if analysis, so that the user can define a variable and its value, and then the spreadsheet will calculate the results of the variable. The current method is the trial-and-error, which rarely exact and very inefficient. Provide capability to integrate data, a portion of the spreadsheet and the graphs, i.e. integrated text and graphics to automatically prepare a presentation ready copy. I look forward to seeing these capabilities in Microsoft Excel soon.

Sincerely,
Raymond Seltman
Chicago
Microsoft
Making it all make sense

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Tell us what's on your mind and it could end up on your screen.

BETTER CHARTING FEATURES.
3D CHARTS
DRAWING TOOLS?

THANKS
DON GAUTHIER
Microsoft
Making it all make sense

MacUser

JULY 1991

Volume 7 Number 7
Cover photo by Walt Denson



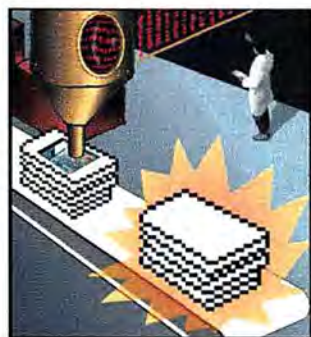
140
Gigadrives:
The best of
the biggest



52
Dynamac
serves up
two Mac
LCs for the
road.



124
Tune in to
the video
revolution.



221
Danny
Goodman
scripts his
top tips for
upgrading
your
HyperCard
stacks.

Features

System 7.0 Update

System 7.0: Getting Down to Business

BY VICTORIA VON BIEL AND DARRYL CHAN

Apple's System 7.0 is amazingly powerful — and amazingly confusing. Here's how to install it on your Mac (or network), get it to work with your favorite applications, and prepare for the deluge of System 7.0-compatible upgrades. **96**

Operating Systems

With Apple's System 7.0 Group Upgrade Kit, you can use your network to convert every Mac you've got to System 7.0 — automatically. **199**

Power Techniques

You're just ten easy steps away from successful installation of the Mac's most powerful operating system ever: System 7.0. **208**

Layouts for Less

BY GREGORY WASSON

You design newsletters, fliers, and reports, but do you need the complexity — and cost — of a high-end page-layout program? You'll save yourself both time and money with one of these five budget-priced desktop-publishing packages. **110**



The Mac/TV Connection: Desktop Video

BY PAUL YI AND THE MACUSER LABS STAFF

Don't let the video revolution start without you! The seven video products we tested let you do it all: put full-motion video into a window on a Mac screen, store video images on a Mac, integrate graphics into video presentations, and use video images with your favorite graphics software. **124**



Gigadrives: The 1,000-Megabyte Solution

BY H. B. J. CLIFFORD, STEPHEN SATCHELL,

AND THE MACUSER LABS STAFF

A megabyte here, a megabyte there . . . Pretty soon you need a 1,000-megabyte hard drive — especially if you work with mammoth databases or do full-color desktop publishing. MacUser Labs torture-tested 19,000 megabytes of storage to find the best gigadrives. **140**

"Imagine using your Mac to manipulate video images as easily as you now write memos, crunch numbers, or record and edit sound." **124**

Sections



NEW ON THE MENU

51

Just out: Dynamac's two portables based on the Mac LC, Resolve and MacWrite Pro (Clariss' new spreadsheet and word-processing programs), and more.

52



DESKTOP PUBLISHING

179

Type

TrueType-based outline fonts banish jaggies on the screen and on the page, and fonts install automatically. Find out what a dozen vendors are doing with Apple's TrueType today.

181

Type

Adobe's Multiple Master font technology lets you create a multitude of sharp, scaled fonts — from condensed to extended — from a single master design.

187



BRIDGES

197

Trouble Shots

You've installed the best network hardware and software, but you've gained nothing in the quality or quantity of people's work. Why? Here's how to make your LAN work smarter, not harder.

205



POWER TOOLS

208

Beating the System

Should you change your System software the instant System 7.0 comes out — or let others serve as Apple's guinea pigs?

213

The Expert's Edge

For photos and color, you need a 24-bit display system — and these tips on how to handle it.

217

Power Programming

You can run those applications you built with HyperCard 1.2 under HyperCard 2.0 — if you follow HyperCard guru Danny Goodman's eight hints.

221

Tip Sheet

How to *really* use Word 4.0's indexing feature, control spacing of repetitive elements in PageMaker, overhaul ImageWriter print heads yourself, and more

229

Help Folder

How to download compressed files from Macintoshes to PCs, revive dead mice, power up all the equipment in your system in the right sequence, globally replace fonts and formats in Word 4.0, pick a surge suppressor, and more

233

Reviews

Microsoft Excel 3.0

The leading spreadsheet program gets stronger *and* easier to use.

56

FreeHand 3.0

Aldus applies some interface polish to this illustrator's toolbox.

58

Taste

An all-in-one word-processing, graphics, and database package that's an all-you-can-eat feast

70

Virtus WalkThrough

Create and explore computer-generated buildings, cities, and other virtual structures.

72

MacFlow

Colorful charting software clarifies complex business plans.

76

MacLinkPlus/Translators

The easiest way to move files to and from PCs.

78

Ultimage and IPLab Spectrum

A pair of scientific image-processing programs helps you visualize and interpret data.

82

Quick Clicks

ADDmotion: Add colorful animation to your HyperCard stacks. **SampleCell:** Music and sound-sampling software, a Mac II board, and a CD-ROM. **SimEarth:** How to build a planet in ten billion years or less. **PickTure:** A nifty visual file selector.

89

Departments

Jon Zilber

The trials and tribulations of Apple at court

23

Robert Wiggins

Do Macs throw a monkey wrench into the meticulous gears of MIS?

29

Guy Kawasaki

Got a minute? Get the top tips from a dozen of Guy's greatest gurus.

41

Michael Swaine

Is it time to exterminate your mouse?

45

John C. Dvorak

The arch-debunker strikes again.

292

Letters

Readers on what's up, where's the UPSes, and how to beat the USPS

13

Advertiser Index

240

Marketplace

274



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 1956 - 1989
 and
 Derek Van Alstyne
 1967 - 1989



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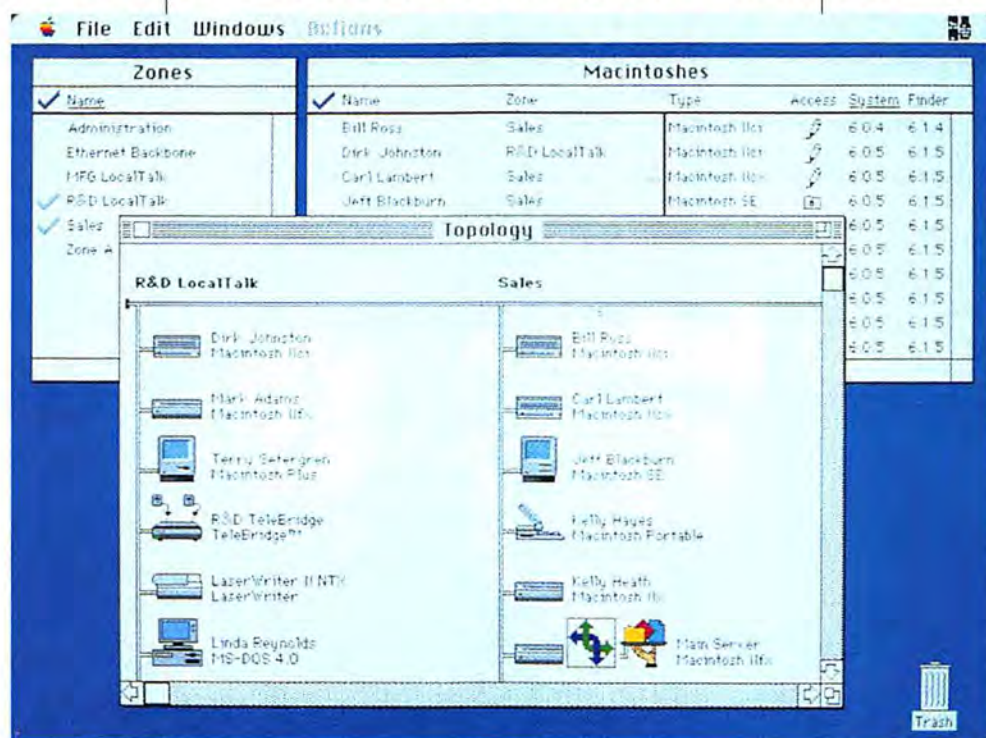
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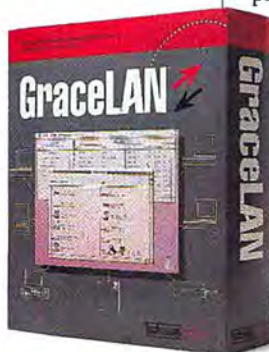
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Color monitor illustration by Rob Mageira.

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MACWORLD, MAY, 1991

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MACWORLD, MAY, 1991



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External		\$269	\$289			\$389	\$319	\$379	\$459	\$789	\$889	\$1,289	\$2,489	\$489
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About

MacUser

I Want My Mac TV

No one has been able to define *multimedia* to everyone's satisfaction. But the lexicographers had better hurry up — because however you define it, the multimedia revolution is already upon us.

Back in February, *MacUser* brought you an overview of this revolution with a buyer's guide to more than 100 multimedia products. Now this issue offers MacUser Lab's first installment of a two-part report on the leading multimedia technology thus far: desktop video. Future issues of *MacUser* will provide ongoing coverage of video, audio, and other Mac-based multimedia products as they come on the scene.

And this is one revolution that will appear not on television but on Macs themselves. Sooner than you might think, video will be just another data source available to Mac users. Already you can put live video on any Mac's display and digitize single or multiple frames of video to drop into page-layout or even database files. For those thirsting for new ways to communicate information, desktop video is a real solution.

Two of *MacUser*'s prime multimedia mavens, associate editor Paul Yi and MacUser Labs project leader Steve Lipson, put together this first-ever MacUser Labs report on desktop video. Not coincidentally, they have also been instrumental in helping establish a special laboratory in our Foster City headquarters that is dedicated solely to multimedia-product testing.

The multimedia lab roosts in an 18th-floor aerie overlooking San Francisco Bay. Hawks soar outside the windows, patrolling surrounding fields. The view would be distracting if the work weren't so interesting.

The lab has its own attractions, even beyond the normal quota of Mac hardware: DAT drives; CD-ROM drives; laserdisc players; special Mac-controlled frame-accurate VCRs; MIDI-based music setups; and a NewTek Toaster with an integrated character generator, 24-bit paint system, solid modeling, rendering, animation, and scripting. Not to mention test equipment such as a Grass Valley Emphasys Encoder, a Tektronix VM700 Waveform analyzer and vectorscope, and an RGB 650AX Scan Converter.

As if all that didn't give them enough to do, Paul and Steve are themselves multimedia creators. Paul is an aspiring filmmaker, and Steve is a MIDI-drumming musician and music-software developer. So they bring to their reportage the multiple perspectives of users, developers, and critics.

MacUser has shown — with Paul and Steve's help — that desktop video is real. The seven products they reviewed for this issue prove that working solutions exist for users' video needs. Now it's up to you to explore and push the limits of the new medium.



Project leader Steve Lipson and on-screen partner, associate editor Paul Yi, know their multimedia.



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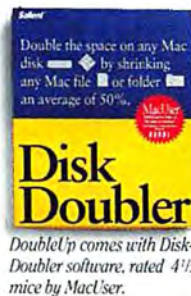
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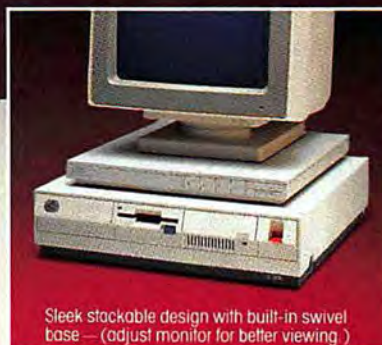
DoubleUp comes with DiskDoubler software, rated 4½ stars by MacUser.

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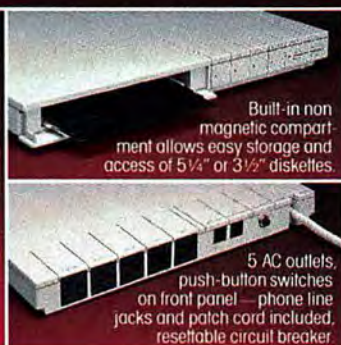
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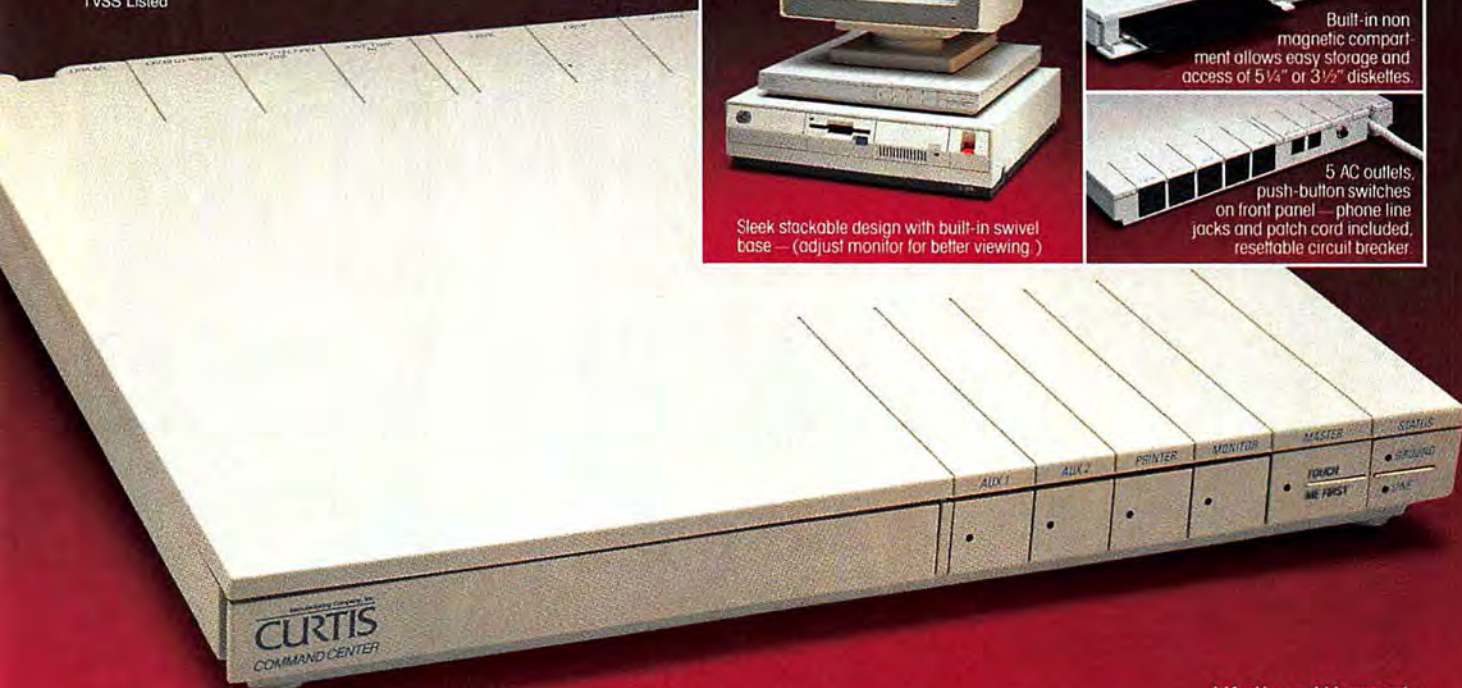


Sleek stackable design with built-in swivel base — (adjust monitor for better viewing.)



Built-in non magnetic compartment allows easy storage and access of 5 1/4" or 3 1/2" diskettes.

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Will Rice, of Austin, Texas, writes with an interesting chromatographic query: "I know that Big Blue is both big and blue, but what color is Apple? Does Guy Kawasaki know? Dvorak? I would hope green (for ecological rather than economical reasons). Could you please look into this?" Glad to. Many people have assumed that Apple is red (for horticultural rather than economical reasons). Guy Kawasaki wrote in his resignation letter to Apple (reproduced in *The Macintosh Way*) that he bleeds six colors. John C. Dvorak, of course, bleeds for no one. The answer must be, then, to paraphrase the famous '60s English rock group that's not suing Apple: It's a rainbow.

✉ Write to Letters to the Editor, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the MacUser Forum of Zmac, our on-line service.

All letters become the property of MacUser, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

Love Apple

Marcy Poulos (Letters, April '91, page 14) complained about Guy Kawasaki's columns, saying she didn't care about Apple, the company, and that she only wanted to read about Apple, the computer.

But many of us do care about Apple, the company. I love my Mazda. I love my Rockport shoes. But I don't care about either company, even though I spend a lot of time in my car and in my shoes. So why is it different with Apple?

Apple's history is our own dream come true. Consider Apple's origin: two bright fellows in a garage. I can picture the two Steves working on their first computers, looking much as we do when we're puttering around in our own garage.

That kinship is strengthened by the Mac's personality. Nothing else I use has one. But the Mac is my friend: respectful, a little whimsical, unprepossessing, quietly powerful — the Robert Frost of machines. The thing even *apologizes* when it bombs.

But computers don't really have personalities, do they? People do, and companies do. So I see in the Mac's interface the company's personality. Respectful, unprepossessing, whimsical: I like this company.

Ross T. Carter
Hallowell, ME

Whimsical? Unprepossessing? You may finally have hit on why Apple made the StyleWriter printer cute but slow. — JB

Cereal Port

Marcy Poulos states that she loves her Macintosh the same way she loves her breakfast cereal. Does that mean that she also reads magazines targeted at eaters of specific breakfast cereals — *Froot Loop Eaters Monthly*, for instance?

Dave Kovacs
Allentown, PA
No, but maybe she reads Life. — JB

Before and After

Timothy Eustis is wrong to assert in his letter "Who is This Guy?" (March '91, page 21) that Guy Kawasaki cannot write. Four months ago, I was still stuck in my "pre-Mac" days. Then I came upon *The Macintosh Way*. Now, not only did I get a Mac Classic for my home but I also have an SE on my desk at work and a full range of Macs in the department I run here in Hong Kong. My team and I sure are glad that I twisted a few arms — productivity is up, and we now know what the "Mac factor" is all about.

Ilyas T. Khan
Hong Kong

Dear Mr. Sculley . . .

Like a prizefighter who suddenly wakes up in the third round, Apple has belatedly come out swinging in the marketing battle of the GUI interfaces. The company recently published a report by Ingram Labs comparing Macs with PCs running Windows. The results showed that you get more for your money with a Mac (for another interpretation, see John C. Dvorak's column this month).

Maybe Apple could have saved some money. Surely most of *MacUser's* readers know at least one person who's bought Windows. Why not let the Windows users try the real thing and see what they say?

Speak Up: How do Windows users react when they try the Mac?

✉ Send your thoughts to Dear Mr. Sculley, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

In April, we asked whether Apple should license its operating system. Brian Hall, of San Francisco, California, thinks not. He bought a new LC — which he loves — at the price, he says, of "numerous problems, hassles, and frustrations

ad infinitum with Apple Customer Support (!) Technical Service (?)." After getting everything straightened out, he feels great relief at being "freed from both the bonds of PC hell and Apple purgatory. Everything I need now I can get from non-Apple vendors." But what has this got to do with Apple licensing its operating system? Simple: "Don't license Apple ROMs. If you do, no one will ever need to buy from Apple, and thus no one ever will."

Kyle K. Smith, of North Richland Hills, Texas, sees things differently. He doesn't want to see a bunch of Mac clones on the market. Instead, he calls for Apple to license application-specific versions of its operating system to makers of consumer electronics. "With the addition of sophisticated and complicated features to televisions, VCRs, and other office and home appliances, it seems like the obvious place to implement the best human user interface system available." He says that this would benefit users of everything from automated teller machines to microwave ovens. "Let's get rid of all these ridiculous text-based menus, numeric keypads, and digital clocks that constantly flash 12:00." Fine, but you'd better make sure there's a programmer's reset button on your microwave before your system bombs.

Clone Head

I'm a PC (clone) user. I decided long ago that I wasn't willing to pay Apple's prices for the benefit of a graphical user interface. But I occasionally buy Mac magazines to keep up with the Mac types, to find out what I'm missing (not a lot), and to see what troubles Mac users are having with their machines and software (about the same as IBM users have).

I bought a copy of your May '91 issue and read it cover to cover (not including all the ads), and I've got to say that whatever your columnist Guy Kawasaki is smoking should be either banned or distributed freely. How he managed to go off on an anti-IBM tangent because of the Prodigy E-mail controversy is beyond me. Does he own substantial amounts of Apple stock?

James Colburn

Rockville, MD

As a matter of fact, as of this writing, Guy doesn't own a single share of Apple stock, but he knows someone who does. See the next letter. —LT

Vote of Confidence

I enjoy reading Guy Kawasaki's column each month in *MacUser*. And I totally appreciated *The Macintosh Way*. His insights have caught the spirit of the Mac and what Apple is striving to regain. I heartily recommend the book.

Although I hold only one share of Apple stock (I wanted to own a small piece of the rock), I would gladly use whatever voting power I have to help seat Guy on the board of directors. Just say the word.

Paul Rego

Jacksonville, FL

Shoulder of Fortune

Although I never write letters to the editor, I have to congratulate you on the May issue of *MacUser*. It's the best issue I've seen, and I've been reading the magazine almost since it was founded. I particularly liked the color hardware Buyer's Guide, the fax-modem tests, and the LaserJet-options article. All three answer Mac questions I've been wrestling with over the past three weeks.

Just curious: Was your editorial staff looking over my shoulder when they put together the issue?

Bill Wolk

Brooklyn, NY

No, that must have been the IRS. We rely on a rare pre-recall copy of Lotus MarketPlace for that kind of information (see the next letter). —JZ

What's in a Name?

Although Jon Zilber's column "In Technology We Trust" (April '91, page 25) appropriately salutes the innovative aspects of the withdrawn Lotus MarketPlace CD-ROM, he missed the point behind the consumer outcry, which was, thankfully, supported by Computer Professionals for Social Responsibility and others.

Zilber's argument that names and addresses may be available in phone books ignores the fact that the phone company offers its subscribers unlisted status ab initio. The basic objection to MarketPlace and similar schemes is their "default" approach, in which they sell your name first and leave you to undo the resulting proliferation later.

Worse yet, MarketPlace would have provided mailing lists selected by age, ZIP code, gender, and spending patterns. Let's recognize the sale of names and addresses without prior permission for what it really is — appropriation of your private property without compensation.

Hats off to Apple and the other socially responsible companies who've abandoned the default sale of their customers' names and addresses!

Robert Alan Soltis

La Jolla, CA

Toparaphrase, appropriating a million names is no problem — but it would be wrong. Unfortunately, it may have just become easier. The U.S. Supreme Court recently ruled that "creative works" that are little more than compilations of generally available data — such as the white pages of your phone book — are not protected by copyright laws. That could make it a lot easier for other software publishers to jump right in where Lotus feared to tread. —JZ

Unlucky 13

I'd like to bring your attention to a flaw in Softsync/BLOC's Accountant, Inc. 2.0 that you must have overlooked when selecting your 1990 Eddy honorable mentions for best financial-management package (March '91, page 98): The program allows a company only 30 days after the end of the fiscal year to close out its books. This is a serious flaw in the foundation of the program. I discovered this fact after I had lost two months' worth of data.

Robert Junk

New York, NY

Accountant, Inc. handles year-end closing with a "13th month" that can last

as long as needed. Users should close within 30 days if they can, though, because subsequent transactions are reported as having occurred in the first month of the new year. This is fine for year-to-date reporting but not for first-month financial reports or certain kinds of project tracking. The moral of the story is that even Mac users must read manuals sometimes. —LT

FullWrite Faithful

I just read Daniel Rasmus' review of FullWrite Professional (April '91, page 83). Basically, it is another article designed to trash FullWrite, and honestly, I'm getting fed up with the misinformation campaign about this program.

FullWrite is a great program. Instead of pointing out the dozens of excellent features it contains, Mr. Rasmus complains about trivia. For instance, I don't really care if the ability to convert Word files is contained in a side program. I don't have Word. I don't like Word. Obviously, I don't need Word import/export functions.

He makes no mention of the slight overall speed improvement of the new version, yet several of your previous reviews complained about the program's lack of speed. It is still not a speed demon, but it is no slower than other programs with similar abilities.

Yes, you need 2 megabytes to get the most out of FullWrite, but it runs just fine in a 1-megabyte environment. It is a big program, with many features. It handles complex graphics, text formatting, and outlining and contains a large convenience feature set.

Dwight Stewart

Surfside Beach, SC

You are entitled, of course, to disdain Microsoft Word, but it is a very popular word processor and it's reasonable to expect that many people will want to be able to easily import and export its file formats. We did give FullWrite four mice, but whether it is a great program or not may soon be moot anyway. Ashton-Tate has never done a major new version of the program (which is more than three years old) and is unlikely to do so in the foreseeable future. At this point, the company doesn't even know if it will do a new version for System 7.0. —JB

Grounded Flight

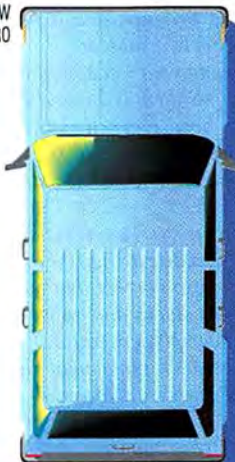
The continued sale of Microsoft's Flight Simulator burns me up. The current version — 1.0 — has never been updated during the five years it has been on the

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MacDraw Pro doesn't.

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MacDraw Pro doesn't.

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MacDraw Pro doesn't.

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MacDraw Pro doesn't.

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Mac market. It does not run on any Mac II model or even on the SE/30.

Flight Simulator is, incredibly, still a top-selling entertainment program. Why Microsoft keeps selling that old horse is beyond me. It shows, once more, where the company's interests lie — Flight Simulator for the PC is at version 4.0.

Kevin Garrett
Woodland Hills, CA

You're right. Flight Simulator 1.0 won't get off the ground with any but 68000-based Macs—but don't throw away your copy just yet. Microsoft plans to release a major revision of Flight Simulator for the Mac sometime this year, complete with an upgrade path for owners of the "old horse"—and in all likelihood, long before the first Windows version shows up. —LT

Keep It Simple . . .

I was intrigued by your "Extended Keyboard Secrets" article (March '91, page 224). I'm sure there are historic (and perverse) reasons for the assignment of accents to the keys of my more-than-\$2-a-key Extended Keyboard, but perhaps there are people at Apple who would risk their career and assign accents in future releases to keys that make sense to users.

For example, what if Option-T generated a tilde over a letter, Option-C a circumflex, Option-A an acute accent, Option-G a grave one, and so forth? Apple should remember the K.I.S.S. principle.

David J. Lüeders
Bethesda, MD

Keys in Sensible Sequence, maybe? Actually, if you think about it, Apple assigned the accent keys to the characters that are most commonly used with those accents. So Apple was sensible (not perverse) after all. —JB

The Magic Touch

I waited five months for the Mac Classic I ordered. It finally arrived, and I'm impressed with the quality, the speed of the 40-megabyte hard drive, its relative silence, and of course the price. It came with System 6.0.7 installed and the new version of HyperCard. So far so good.

However, I soon found that this version of HyperCard didn't provide any tools for stack development or for browsing. To make matters worse, with System 6.0.7, I couldn't run the original version of HyperCard with which I had developed my stacks. The conversion function did not work properly. Essentially, I was left with nothing. HyperCard was the mainstay of

the educational programs I was using.

Robert Rupnow
Honolulu, HI

The version of the HyperCard application Apple provides with the latest Mac models is identical to the one that is sold separately. It does not, however, include most of the sample stacks that are found in the Claris product, and it has had the scripting level disabled.

*To enable your version of HyperCard (assuming System 6.0.7 and HyperCard 2.0 have been correctly installed), type **set userlevel to 5 <Return>** into the message box while the first card of the Home stack is visible. Then go to the last card in the Home stack, and type **magic <Return>** into the message box.*

You're also correct that many earlier HyperCard stacks don't always run correctly under HyperCard 2.0, which has slightly stricter syntactical rules. For a complete discussion of how to make those stacks compatible, see Danny Goodman's Power Programming article in this month's issue: "Moving to HyperCard 2.0." —BM

The Suggestion of Power

I'd like to suggest that your MacUser Labs do one of its wonderfully thorough reports on uninterruptible power supplies that are appropriately sized for Mac systems. I'm extremely interested in purchasing one, but the multitude of features on the many different products has overwhelmed me.

Paul Kelly
Saint Clair Shores, MI

Your wish is our command. We've started testing for a report that's scheduled to run later this year. In the meantime, don't use the hair drier, the microwave oven, and the Mac at the same time. —NG

Out of Tempo

Thank you for reviewing our new Tempo II Plus in your May issue (page 64). The released version of Tempo II Plus was 2.0.1, and we are currently at version 2.0.3. You reviewed an earlier version of Tempo II, 1.2.4, to which you added our Tempo+ Tools. Tempo II 2.0.3 is a greatly updated integration of the earlier releases.

The review mentions the many incompatible applications listed in our About file, but most of them have truly minor incompatibilities. In including such minor tips, we recognized that a quick glance at the file might be misleading but that our

users would nonetheless prefer that we provide the tips rather than gloss over the incompatibilities. Also, many of the items have since been addressed through updates, both in our software and in that of other publishers.

The MultiFinder external mentioned in the review is not present to "address deficiencies in Tempo II Plus itself" but to add an essential ability. Apple's Font/DA Mover cannot first check to see if your Mac is in Finder or MultiFinder mode before running, let alone toggle to the other mode, but Tempo can! Our 40-some externals are designed to make macros that can automate routines, and although they may not be obvious at first sight, they're beautiful when you need them.

The review says that Tempo II Plus and QuickKeys 2 are "two programs designed to keep your hands off the mouse." In fact, Tempo II Plus is designed to help your Mac perform many activities without your hand on the mouse or the keyboard, a capability not offered by any other Mac macro utility and in fact unmatched on any other platform.

We have always regarded QuickKeys highly and even recommend it for some needs, but the two products are completely different in design and purpose. Even its publisher has never referred to QuickKeys as a program for creating macros, a word that is completely shunned in its manual. I don't believe that this detracts from its program, but it does emphasize the difference.

Rick Barron, President
Affinity Microsystems Ltd.
Boulder, CO

We commend you for being up front about incompatibilities — most publishers make you find out the hard way. Our reviewer actually did have version 2.0.1 of Tempo II Plus—the review's report card listed the wrong version number. —SJ

A SIMMple Misunderstanding

I appreciate the wide variety of articles MacUser runs on subjects such as networking and routers that appeal to the corporate user.

In "SIMMple Pleasures" (April '91, page 194), Owen Linzmayer says that 2-megabyte SIMMs are supported only in the IIsi. I have an article from the Apple Support Coordinators Newsletter that says that the LC also supports them.

Peter R. Tittler
Garden City, NY

Two-megabyte SIMMs are supported

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That's a full \$1000 less than Apple's \$2599 Personal LaserWriter® NT. But that doesn't mean the BLP Elite has less to offer. In fact, the BLP Elite is packed with more features you want, like true Adobe® PostScript and built-in AppleTalk® for sharing over a network. There's also edge-to-edge printing for super-sized spreadsheets and banners, and a straight-through paper path for printing wrinkle-free envelopes and labels.

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LETTERS

for both the LC and the IIx; when the story was written, Apple did not yet support the new SIMMs for the LC. — JR

Neither Rain nor DOS

Niles Carter (Letters, May '91, page 16) complained that the U.S. Postal Service discriminates against Mac users because the USPS' computerized mailing-list service can read only DOS-formatted database disks. (This mailing service adds ZIP+4 ZIP codes to the mailer's text files and allows mailers to save on postage.)

I have been able to use this service — with my Mac — to update street addresses and add ZIP+4 information to my 17,000-name mailing list.

To do this, I just used Apple's file-exchange program to format a DOS disk, after which I converted my Mac text file to an IBM text file. It all took less than five minutes. (The file-exchange program is included on all Apple system-utility diskettes.) When the USPS mailed me the ZIP+4 information, I used the same file-exchange program to convert the IBM text file to a Mac text file.

Make sure that your original text file contains all the key fields from your database. Then your database can use these fields to automatically import the updated information back into your database and also update each address and ZIP code. Without these fields, you must input all the new information by hand.

Robert Leahy
Tustin, CA

Under the Hood

Your article "Life Begins at 40 Megabytes: Small Hard Drives" (April '91, Buyer's Guide page 4) was informative and clearly written. The authors stated that Conner Peripherals makes the internal hard-disk drive for the Mac Classic. I decided to verify their assertion, so I used SCSI Probe to ascertain the manufacturer of my Mac Classic's internal hard-disk drive. The program reported that the drive is a Quantum model LP40S. Who made the internal hard-disk drive?

Barry F. Wolf
Piscataway, NJ

The drive in your Classic was made by Quantum. To keep up with the heavy demand for Classics, Apple has turned to multiple OEM sources for internal hard-disk drives. Although Conner is probably still the most common (being the least expensive), both Sony and Quantum drives are also being used. — JB

Boring . . .

John C. Dvorak claims in his commentary "Let's Spell Mac B-o-r-i-n-g" (May '91, page 348) that the Mac's high-end-application direction is boring because he's not an animator, graphic artist, art director, ad-agency copywriter, typesetter, prepress technician, photographer, or professional artist. "How about the rest of us?" Mr. Dvorak asks. I ask who the "rest of us" are if they aren't some of the above? Most of us probably are one of the above, and we're thankful for the new high-end programs and hardware now available. They help us use our Macs to make money.

Suzanne Kimball
Irvine, CA

Boring . . .

Boring . . . boring? Maybe John C. Dvorak and I were at different Macworld Expos. Maybe he just went to the parties and was wined and dined by the big companies who were trying to impress him. Maybe he was, or is now, trying to impress them — and us. Boy, I'm sorry he was so bored! Maybe he should go back to his IBMPC (which is trying so hard to become as interesting as a Mac) and just forget about MacAnything.

I spent all four days at the Expo — but I was never bored. I talked to the "big" people and the "little" people. I had fun, and I learned a lot! I cheered Guy Kawasaki along with all his other groupies. From top to bottom in most Mac-associated companies, you find enthusiasm and a thirst for knowledge. My kind of people!

Peggy Cartwright
San Francisco, CA

. . . Gone

I read in utter disbelief the things John C. Dvorak had to say about the Mac in the May '91 issue of *MacUser*. What he did was knock an entire industry — the computer itself and the software developers. I think it's a shame he has to single out the Mac for his frustrations.

The advances made on the personal computer and in its capabilities over the past seven years have been nothing less than amazing! Did Dvorak also think that desktop publishing was boring in 1984? What did he complain about then — spreadsheet programs weren't fast enough for him?

Is Dvorak serious about wanting to tell a computer to draw Donald Duck and then tell it to draw a fire hydrant? Get real!

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LETTERS

What could possibly be more boring than that?!

Fletcher Maffett
Sterling, VA

Running on Empty

I want to relate a personal example of "bending the rules" on daisy-chaining SCSI devices, which you discussed in the article on small hard drives (April '91, Buyer's Guide page 14). After buying a Jasmine DirectDrive 40 portable hard-disk drive, I was dismayed to discover that power was provided by means of the floppy port on my Mac Plus. I was reluctant to give up that port, as a second floppy drive on a Plus is as important as a mouse. But then a friend said I could just daisy-chain it. I replied that there's no port for daisy-chaining on the floppy drive. But when I checked the nether regions of my Apple 3.5 Drive, lo and behold, I found a cover for another floppy port! The manual said that the drive could be daisy-chained on an Apple IIcs. So I figured that this should apply to my Mac Plus as well.

I connected the Jasmine drive's floppy input to the second port on the floppy drive, held my breath, and turned everything on. I've been running both the Jasmine drive and the external floppy from the Plus for about three months now and haven't had any problems. I am a bit concerned about the power supply, but it hasn't blown yet.

Michael A. Shelley
Houston, TX

You're pushing it. The Mac Plus lacks the Apple IIcs' power reserve. Don't run anything important on your hard disk when you eject a floppy—that's when the power draw peaks. —JR

Clarifications

In "SIMMple Pleasures" (April '91, page 194), the IIsi was incorrectly referred to as needing a PMMU chip to run some programs being discussed. In fact, the IIsi's 68030 processor has PMMU functionality built in.

In the "On the Horizon" sidebar in the "EtherTalk-to-LocalTalk Routers" lab report (April '91, page 164), the estimated speed improvement of JDL's Excelsior multichannel EtherTalk-to-LocalTalk router was incorrectly stated. JDL believes that the router can make your network two to five times as fast as it does otherwise, depending on the configuration. Also, JDL's correct toll-free number is (800) 535-3969.



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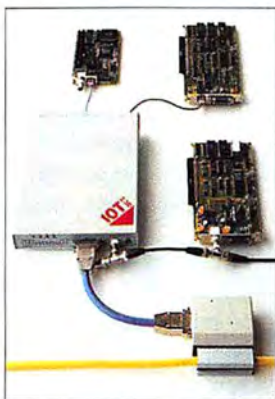
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connector for a telephone system punch-down block.

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Malpractically Speaking



**The verdict is in:
Apple is guilty — of
failure to arm its
customers with the
information they
need to buy, use,
and cost-justify
their Macs.**

Hear ye! Hear ye! The Oh-So-Superior Court of Cupertino is now in session. All rise for Judge Hank M. Hye."

"Thank you, bailiff. Counsel will approach the bench."

"Your honor, as counsel for the prosecution, we represent the owners of Macintosh computer equipment, all of whom have collectively filed a class-action suit against the defendant, Apple Computer, for malpractice."

"Malpractice? Malpractice of what?"

"Specifically, the Claris conundrum, operating an operating system without a license, and failure to provide adequate ammunition for users. We will explain the details in a moment."

"And what does the defense have to say about these charges?"

"Your honor, we contend that Apple has more-important lawsuits to deal with and should be given a break on general principle."

"I didn't realize it had any general principles. Well, let's get this show on the road. Mr. Prosecutor, call the first witness."

"Your honor, for reasons that will become apparent, our first witness has asked to be guaranteed anonymity under the Silicon Valley witness-protection program. He's the gentleman over there with the dark glasses."

"Ah, yes, I see him. Very well, for security purposes, we'll identify Mr. Bill Gates only as 'Witness X.' You may take the stand, Mr. X."

"Look, I've got to give a deposition in the courtroom next door about the look and feel of Windows versus the Mac before noon, when I've got an appointment with the antitrust hounds at the FTC who are trying to do to Microsoft what they did to the phone company. So if we don't make this fast, you might end up having to dial 1 every time you want to eject a floppy disk."

"We'll try to accommodate your schedule, Mr. X. Now, you have some comments to make about Claris."

"Yes, your honor, I do. When Apple reneged on its plan to spin off Claris as a fully independent software company, it committed an egregious error. At Microsof — er, at my company, we're always looking for win-win opportunities, and I'm not just talking about Win3. Only a company with blinders on could miss out on all the win-win opportunities that are constantly presenting themselves to savvy computer companies. Like suing Apple, for example."

"Whenever we sue Apple, either we win —

which is good — or we lose — which is also good, because it helps us convince the FTC that we're not the all-powerful force in the microcomputer arena that they're trying to make us out to be."

"Claris, on the other hand, seems to have turned into a lose-lose opportunity for Apple. If Claris loses in the marketplace — by losing market share to other application-software companies — Apple loses. And if Claris wins — by dominating the application-software market — Apple loses, because Claris' domination will drive most of the independent software publishers out of the market. And if that happens, Apple's sunk, because an open and competitive third-party-software market is the only thing that maintains the high level of innovation a computer company needs in order to thrive."

"I see — that must be why you graciously concede ten percent of the Mac spreadsheet market to other parties. That will be all, Mr. X. You may step down now. Just don't leave town, OK?"

Justification of the Piece

"We'd like to call our next witness, an expert on how to cost-justify equipment purchases. Would Mr. Ty Mizmoney please take the stand? Now then, Mr. Mizmoney, you are the author of *How to Use Statistics to Win Friends and Influence People*?"

"That is correct."

"And you're a computer consultant on the side?"

"That's why I'm here today. Apple has provided users with incredibly powerful solutions to a wide range of computing problems. But it's failed to give its customers and converts the ammunition they need to justify the cost of the Macintosh solution to the folks who monitor their budgets."

"Give us an example."

"I've got a client who's been happy with his Mac Plus for several years. Suddenly there was all kinds of noise about the SE — and now the Classic. Is it worth upgrading CPUs and peripherals to keep up with the times? It is, but Apple's never bothered to tell him."

"Could you give us a concrete example, Mr. Mizmoney? How would you rationalize the cost of a full-page display for a Mac SE owner?"

"Oh, that's an easy one. Let's say that you use your Mac six hours a day. Now, depending on what kind of work you do on your nine-inch Mac screen, let's say you need to scroll beyond



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Thu	05/31/90	07:03:27 PM	8:11	logged in
Fri	06/01/90	07:00:46 AM	8:11	logged out
Fri	06/01/90	07:00:56 AM	8:11	logged in
Fri	06/01/90	07:01:11 AM	8:11	accessed control panel
Fri	06/01/90	07:01:16 AM	8:11	added new user: Carol
Fri	06/01/90	07:01:32 AM	8:11	logged out
Fri	06/01/90	07:01:46 AM	8:11	logged in
Fri	06/01/90	04:02:00 PM	8:11	logged out
Fri	06/01/90	04:02:54 PM	8:11	logged in
Sat	06/02/90	04:03:07 PM	8:11	logged out
Sat	06/02/90	04:03:19 PM	8:11	logged in
Sat	06/02/90	07:03:36 PM	8:11	logged out
Sat	06/02/90	07:03:48 PM	8:11	logged in
Sat	06/02/90	02:01:02 AM	8:11	logged out
Sat	06/02/90	02:01:13 AM	8:11	logged in
Sun	06/04/90	08:01:49 AM	8:11	logged out
Sun	06/04/90	08:02:01 AM	8:11	logged in
Sun	06/04/90	10:02:13 AM	8:11	logged out
Sun	06/04/90	10:02:23 AM	8:11	logged in

KENSINGTON.

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a 286 versus a 386 versus a 486—but how many Mac owners know the basic stats for an SE versus an si versus an fx?

“Yeah, I know—none of that matters. All that matters is whether the machine helps you get your job done, something

the Mac excels at. But that’s like trying to argue with a baseball fan that a player’s stats don’t matter, that all that matters is whether or not he hits the next ball out of the park. If the bean counters want to talk stats, Apple should make sure all its

customers have a cheat sheet memorized. Instead, Apple’s advertising and marketing seems intent on merely giving customers enough warm fuzzies to make the Greenhouse Effect look like a tea party.”

Defense Cuts

“Does the defense have any witnesses, counselor?”

“The defense calls the Apple CEO, Mr. John Sculley, to the stand.”

“Mr. Sculley, do you solemnly swear to tell the truth, the whole truth, and nothing but the truth?”

“How did Gates answer that?”

“We’ll take that as a ‘yes.’ Now, Mr. Sculley, perhaps you’d like to tell the court about your new operating system.”

“Ah, yes, well, System 7 is about to change the future of personal computing, and—”

“And how do you know that?”

“Well, because that’s what it said on the System 7 rollout T-shirt. But what I really wanted to say was that—”

“Mr. Sculley, isn’t it true that you really need at least four megabytes to get anywhere with System 7?”

“Well, I suppose, but what I—”

“And, Mr. Sculley, isn’t it the case that this business about applications talking to each other can work only if competing software companies get together and tell each other about their upcoming software releases, a situation even less likely than Mr. Macy telling Mr. Gimbel what he’s putting on sale next week?”

“Well, but we—hey, wait a second. You’re supposed to be the counsel for the defense!”

“Yes, but I also bought an SE for two thousand dollars just one week before the Classic came out for half the price. Now then, Mr. Sculley, perhaps you’d like to tell the court about the Mac Portable?”

“Ah, yes, now there’s—”


“Excuse me, Mr. Sculley; the jury is about to deliver the verdict.”

“But, your honor, I still haven’t said a word about all the good things Apple and the Macintosh can do for you.”

“That’s exactly the point, Mr. Sculley. That’s exactly why we seem to have a hang jury.”

“Don’t you mean a ‘hung jury,’ your honor?”

“Nope. I meant what I said. Noose fittings are next door. And now, will the bailiff call the next case? Uh—oh—it looks like you’re going to be a bit late for that next appointment, Mr. Gates.”



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Lowered Standards



PC worshipers in the MIS world accuse the Mac of being a standards-buster. They couldn't be more wrong.

As long as there have been computers, there have been attempts to settle on standards. Since the early days of mainframes, people in data processing have tried to get everyone to pull their oars together (often to the beat of the MIS drum).

When computers left MIS clean rooms and moved into other corporate departments, the search for standards became almost frenzied. And as more options became available, companies and managers tried all the harder to curtail those options.

Now it's beginning to look as though the Mac — a revolutionary computer in many respects — may have started a standards revolution that the confederates of conformity have overlooked. And this revolution threatens the very foundations of the standards movement.

Considering the way computers evolved, it's easy to sympathize with the quest for standards. When computers were new, they were hard to use. The first machines required their operators to talk to them directly in binary, or at best, in octal (base 8). These machines were idiosyncratic too. Some didn't even have keyboards — you programmed them with front-panel switches.

Consequently, knowledge about one kind of computer was worthless when you faced another kind. Even different machines from the same vendor might require operators to learn different machine languages.

As mainframes grew up, programmers developed operating systems that made computers easier to work with. But different manufacturers still used different operating systems. And some computers could run several operating systems. Despite rapid improvements, users still faced a computational Tower of Babel.

From Chaos to COBOL

This problem persisted throughout the era of mainframes. Technological improvements continued to make computers easier to use, yet at the same time these changes increased the confusion. Soon there were not only operating-system issues but also database issues, telecommunications issues, and application-program issues. The number of possible combinations of hardware and software became so huge that no one could learn all the languages and interfaces. Out of this morass of confusion, the standards movement began.

One of the first major standards in the world of computing was COBOL (COmmon Business Oriented Language), a programming

language. The standard was developed by CODASYL, the Committee on Data Systems Languages, and was given the imprimatur of ANSI, the American National Standards Institute (home of ASCII).

Few people hold COBOL in high regard today, but no one can argue with the fact that COBOL gave impetus to a trend toward programming languages that were compatible across operating environments (usually with only minor dialect differences). This was a big step forward, even if it was made by a committee-designed programming language.

Not all attempts at establishing industry-wide standards were so successful. CODASYL's attempt at establishing a standard database-description language flopped, but industry standards continue to be set by organizations such as CCITT (Comité Consultatif International Télégraphique et Téléphonique, an international committee that sets standards for international telecommunications).

With the advent of the minicomputer, the situation became even more chaotic. Now decisions about hardware and software were taken away from MIS and relegated to individual departments. The MIS group was reduced from selecting standards to publishing standards (and trying to get corporate headquarters to give it the muscle to enforce them).

This environment was responsible for the rise of UNIX as an operating-system standard. It ran on almost any machine, and its programmers' and users' knowledge was applicable in different operating environments.

How PCs Became Walls

Then came the microcomputer, and all bets were off. The purchasing-decision level was now extended down to individual managers in many cases, so even within the same department, different hardware and software configurations could be at work.

Company managers began to fear that they were creating a generation of employees dependent on specific technologies — employees who wouldn't be able to move from department to department. So when IBM entered the microcomputer market and acquired a large market share, the decision to standardize on the PC was a no-brainer for many companies. Edicts came down from on high (often just rubber-stamp approval of MIS plans), and standardization became the rule.

Many people ran into the PC-standard wall when they tried to bring Macs into their

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companies. Considering the number of companies with such standards (some even with approved software lists), it was often a tribute to the persistence (and sometimes sneakiness) of the early Mac devotees that they were able to get Macs into many businesses at all.

But there were success stories, and the Mac beachheads that were established in many companies finally became accepted as a second standard — albeit a less-acceptable one.

Microcomputer software, on the other hand, posed a considerable problem. When companies had to worry only about the IBM PC, it was easy to standardize on Lotus 1-2-3 as the spreadsheet program and WordPerfect as the word processor. As a result, these two programs dominated their respective DOS markets, but neither of them existed on the Mac in the early days. Even now, seven years later, we're still waiting for a Mac version of 1-2-3.

What did exist on the Mac was a word processor, MacWrite, that was bundled with every Mac. Naturally, it became a standard, although that success proved somewhat fleeting. And Excel quickly became the standard Mac spreadsheet program. It remains to this day one of the few true standards on the Mac — at least in the way PC people think of standards.

Formats, Not Applications

What happened on the Mac over time was subtle — so subtle that it went unnoticed by the standards bearers. Rather than programs becoming standardized, file formats became standardized. No longer was it a program issue; it was a data-sharing issue.

The seeds of this minor revolution were sown by Apple when it chose to distribute MacWrite and MacPaint — and, later on, HyperCard — for free. Because these applications were given to everyone who bought a Mac, everyone had them. But because they were free, Apple had little incentive to improve on them.

Consequently, a generation of software sprang up that had to be able to read and write the WORD/MACA and PNTG/MPNT file formats (yes, the MacWrite file format's technical name is WORDQ; Word's format is called WDBN/MSWD. MACA was short for MacAuthor, which was originally going to be MacWrite's name). The PNTG file format remains the bit-mapped graphics format for the Mac, although most drawing programs have

moved on to bigger and better formats.

These aren't the only two file formats Apple introduced. Apple created the PICT format as a standard interchange format for object-oriented drawings (such as MacDraw output) and later a color PICT format. Other file-format standards came along that Mac programs adopted, including EPS (Encapsulated PostScript) and TIFF (Tagged Image File Format). Internally, Apple standardized types of software artifacts called resources, which all Mac programs used. Standardized resources helped applications provide apparently seamless cutting and pasting.

Users as Hammers

In addition to the standardization of file formats, Apple's gifts of MacWrite and MacPaint had a second result: The promulgation of what is now commonly accepted as *the* Mac interface.

Apple worked very hard with all its third-party developers to ensure the consistency of all Mac-program interfaces. Apple wanted to be sure that users wouldn't be confused when they moved from program to program.

Because everyone received several programs free with their computer, going against the consistent interface would stand out. The Japanese have a saying: "The nail that sticks up gets pounded down."

Users were the hammers. They demanded — and got — changes in non-standard interfaces. For example, the original ThinkTank's "hot borders" were replaced with standard scroll bars in later versions of the program.

The consistent user interface across programs meant that users were no longer being forced to learn a new user interface with each application, so that switching from MacWrite to Word on the Mac was nowhere near the challenge of switching from WordPerfect to Word on the PC.

The result of all the changes introduced by the Mac is that software packages themselves aren't the standards that they are on the PC. The standards on the Mac are the consistent user interface and the file formats.

These two not-so-minor revolutionary developments have freed the business user from the shackles of "approved" software and let departments, groups, managers, and users choose the package that is right for them — as long as it can share files with the other programs already in use at the company. ☐



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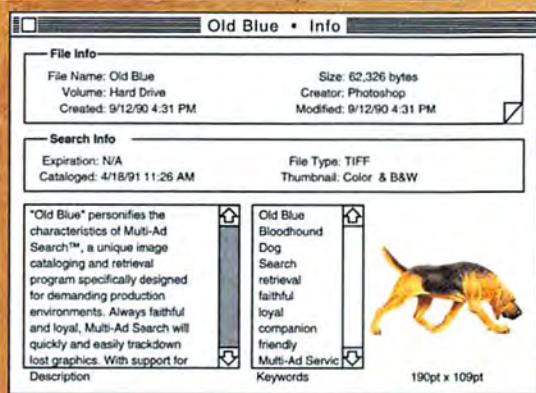
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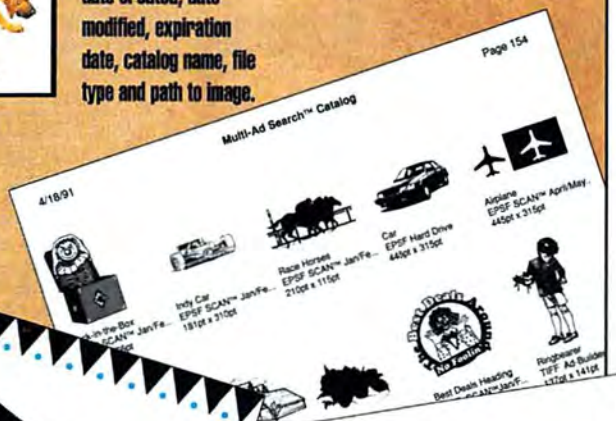


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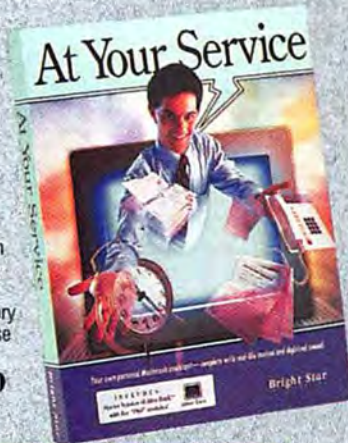
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2859	Artfraits Pak	49	0255	MacRummy	31
0178	Business Images (Clip Art)	79	3625	Mac Ski	38
0135	Florent Laser Font Library 4.0	99	0650	MacGolf	33
0078	Font Monger	62	1984	MacGolf Classic	51
3559	Math Type	88	0255	MacRummy	31
3560	Para Font	58	2235	Manhole	27
MultiMedia			2221	Mean 18	25
3974	Animation Works	122	2923	Micro League Baseball II	37
3277	Computer Eyes - Color	348	2730	Might & Magic I	38
3278	Computereyes - B/W	194	3463	Mission Starlight	28
3850	Film Maker	320	2062	Mobius	24
2918	Interface	248	4390	Monari's Revenge	31
2982	Macromind Accelerator	124	3580	Nemesis Deluxe	84
2583	Macromind Director 2.0	628	2892	Nemesis Go Master	41
3851	Macromind Media Maker	488	2893	Nemesis Joskei Genius	26
3470	Media Tracks	188	3581	Nemesis Tactical Wizard	34
3471	Media Tracks Multimedia Pk.	318	0191	Nemesis Jr.	20
0180	Quick Image 24-Bundle	649	0895	NFL Challenge	54
0208	QuickView Studio	1795	0240	OIDS	39
3483	Raster Ops TV Tuner	375	1978	P-51 Mustang Flight Sim	25
3482	Raster Ops Video Expander	525	2737	Panzer Battles	28
Drafting and CAD			2756	Pipe Dream	16
3289	Blueprint 2.0	298	0473	PGA Tour Golf	38
3693	Claris CAD 2.0	644	2164	Pirates!	34
Design Your Own Home			2983	Playmaker Football	28
3609	Architect	64	2557	Puzzle Gallery	28
3610	Interiors	64	2069	Road Racer	37
3611	Landscape	64	0145	RoboSport	37
2015	Dreams	418	2888	Sands Of Fire	32
2225	Genetic Cadd Level 1	83	1916	Sargon IV	27
3679	Genetic Cadd Macintosh	374	1024	Scrabble	23
0429	MacDraft 2.1	278	2063	Shufflepuck Cafe	24
2200	MacDraw II 1.1	284	3800	Sim Earth Planet Simulator	39
3540	MiniCAD Plus 3.1	585	2300	Simcity 1.2 B&W	29
3468	Relational Objex	148	2747	Simcity Color	46
2646	Versacad Drafter	525	3462	Sky Shadow	28
Entertainment			0261	Solitaire DA	23
0067	22nd Street Whist	31	1622	Solitaire Royale	19
3599	3 In Three	31	2980	Space Rogue	30
3849	Curse Of The Azure Bonds	38	3175	Starlight	39
2727	AD&D: Pool Of Radiance	32	3829	Stratego	35
			3112	Synchronicity	48
			2909	Taskmaker	26
			3934	Tessare	31
			1980	Tetris (B&W And Color)	21
			2884	The Playroom	28

Part #	Description	Price	Part #	Description	Price
1536	Trust & Betrayal	21	2927	Vocabularn Spanish 2	35
0584	Uninvited	24	2837	Vocabularn French 1	35
3808	Vette!	32	2926	Vocabularn French 2	35
3602	Weaver Baseball 1.5	33	2836	Vocabularn German 1	35
3110	Welltris	21	2925	Vocabularn German 2	35
<i>Where Is Carmen San Diego?</i>					
2749	Where In Europe?	28	2928	Vocabularn Italian 1	35
2498	Where In The U.S.A.?	28	2929	Vocabularn Italian 2	35
2186	Where In The World?	28	2929	Vocabularn Japanese 1	35
3513	Where In Time?	28	2929	Vocabularn Japanese 2	35
1628	World Class Leader Board 4.0	26	2929	Vocabularn Japanese 2	35
Education					
3587	Accu-Weather	49	3051	Beginning Level	51
1438	Adobe Illustrator Design Book	22	3052	Intermediate Level	51
3848	Alge Blaster Algebra Plus	35	3053	Advanced Level	51
1527	Algebra	39	3054	Additional Features	51
1614	Alphabet Blocks 1.10	29	3071	Database and Form Letters	51
0910	Arithmetic	39	3072	Advanced Databases	51
1415	At Your Service	30	3073	Spreadsheets	51
1986	Calculus	59	3074	Word Processing	51
1532	Discrete Mathematics	39	<i>PageMaker 4.0</i>		
3661	Earthquest	48	3055	Beginning PageMaker	51
0246	GEMS of the Word KJV	25	3056	Intermediate PageMaker	51
0245	GEMS of the Word NIV	25	3057	Tips & Techniques	51
0892	Geometry	59	3058	Advanced Features	51
0247	HyperBible 2.0 KJV	124	3383	What's New for 4.0 - Part 1	51
0248	HyperBible 2.0 NIV	124	3384	What's New for 4.0 - Part 2	51
1395	HyperCard Handbook 2.0	21	<i>Freehand 3.0</i>		
3206	HyperCard Script Lang Guide	18	3059	Beginning Freehand	51
<i>HyperGrid Software - Language Training</i>					
<i>Spanish</i>					
3740	Pronunciation Tutor	34	3060	Intermediate Freehand	51
3739	Tense Tutor	41	3061	Creating Special Effects	51
3738	Verb Tutor	38	3061	Creating Special Effects	51
3737	Word Torture 4.0	34	3061	Creating Special Effects	51
<i>French</i>					
3742	Pronunciation Tutor	34	3062	Additional Features	51
3744	French Tense Tutor	41	3062	Additional Features	51
3743	French Verb Tutor	38	3062	Additional Features	51
3741	French Word Torture 4.0	34	3062	Additional Features	51
<i>German</i>					
3746	German Pronunciation	38	3062	Additional Features	51
3747	German Verb Tutor	38	3062	Additional Features	51
3745	German Word Torture 4.0	34	3062	Additional Features	51
<i>Italian</i>					
3748	Word Torture 4.0	34	3062	Additional Features	51
<i>Russian</i>					
3733	Introduction to Russian	28	3062	Additional Features	51
3735	Russian Noun Tutor	58	3062	Additional Features	51
3734	Russian Verbal Aspects	41	3062	Additional Features	51
3732	Russian Word Torture 4.0	34	3062	Additional Features	51
<i>Japanese</i>					
3750	Japanese Easy Kana	128	3062	Additional Features	51
3749	Japanese Kanji Master	98	3062	Additional Features	51
<i>Learn to Speak - Series</i>					
3892	French CD ROM	60	3062	Additional Features	51
3893	Spanish CD ROM	60	3062	Additional Features	51
3758	Individual Trng Pgmkr 4.0	34	3062	Additional Features	51
1585	Inside Macintosh Vol. 1	16	3062	Additional Features	51
1586	Inside Macintosh Vol. 2	16	3062	Additional Features	51
1587	Inside Macintosh Vol. 3	16	3062	Additional Features	51
1588	Inside Macintosh Vol. 4	16	3062	Additional Features	51
1629	Inside Macintosh Vol. 5	16	3062	Additional Features	51
1969	Inside Macintosh X-ref	8	3062	Additional Features	51
0260	Interactive Physics 1.2	188	3062	Additional Features	51
2763	Kidsmath	25	3062	Additional Features	51
0357	Kidstime	25	3062	Additional Features	51
3751	Lifeguard	38	3062	Additional Features	51
0021	Mac Bible Greek	98	3062	Additional Features	51
0023	Mac Bible Hebrew	98	3062	Additional Features	51
0017	Mac Bible KJV	56	3062	Additional Features	51
0018	Mac Bible NIV	56	3062	Additional Features	51
0018	Mac Bible NRSV	56	3062	Additional Features	51
3816	Mac Bible - Combo Pack	29	3062	Additional Features	51
3815	Macintosh Bible - What Now?	24	3062	Additional Features	51
3814	Macintosh Bible 3rd Ed	18	3062	Additional Features	51
3200	Macintosh Bible 3rd Ed	21	3062	Additional Features	51
2473	Macintosh Bible 3rd Ed	21	3062	Additional Features	51
3101	Macintosh Bible 3rd Ed	21	3062	Additional Features	51
2439	Mastering Wingz	17	3062	Additional Features	51
0224	Math Blaster	28	3062	Additional Features	51
0223	Math Blaster Mystery	28	3062	Additional Features	51
2593	Math Blaster	28	3062	Additional Features	51
2736	Mavis Beacon Teaches Typing	31	3062	Additional Features	51
0072	Number Munchers	28	3062	Additional Features	51
2445	Numbermaze B&W	25	3062	Additional Features	51
0074	Oregon Trail	28	3062	Additional Features	51
<i>Penton Overseas - Vocabularn</i>					
2838	Vocabularn Spanish 1	35	3062	Additional Features	51

Part #	Description
0257	Dix Music Constr. Set 2.5
3127	Final 2.5
1618	Jam Session
1958	Mac Drums
OpCode Systems	
3937	EZ Vision
3939	MIDI Play
3938	MIDI Translator
3128	Musicprose 2.0
Passport Designs	
0309	AudioTRAX
0312	Desktop Music Creativity CD
0313	Encore
0310	HyperMusic MIDI Player
2828	Mastertracks Pro 4.0
1355	MIDI Interface
2607	Note Writer II
0311	Sound Apprentice
0303	TRAX
2442	Perceive
2500	Performer 3.5
1479	Practica Musica 2.2
0539	Professional Composer 2.3
2860	Sound Clips 1
2861	Sound Clips 2
3626	Sound Clips 3
3627	Sound Clips 4
3457	Sound Exciter
1973	Super Studio Session 2.0
Programming	
2071	Just Enough Pascal
3431	Prograph 2.0 W. Compiler
1473	Qued-M
2054	Quick Basic 1.0
Serius Corporation	
3408	Serius Developer
3409	Serius Programmer
3410	Animation Objects
3411	Communication Objects
2844	Smalltalk/Vmac
0915	Think C 4.0
3225	Think Pascal 3.0
1884	TMON 2.8.4
1834	True Basic 2.02
1207	Visual Interactive Prog
1964	Zbasic 5.0
Hyperware & CD's	
3985	AddMotion
3506	All Of Mac Tutor CD
3510	Baseball Guide and Reg CD
0241	BBS in a Box CD
3863	CD Funhouse
0150	CD CD
3493	Cosmic Osmo CD
0244	Down to Earth CD
3507	Disc Tracy Prog Detect CD
0472	Front Page News CD
3512	GEM (Public Domain) CD
0152	GigaROM CD
1462	Hyper Dialer
3843	Hypercard 2.0 Dev Kit
2809	Hypercard 1.2
3466	HyperHIT 1
3469	HyperHIT II
2525	HyperTMON
3777	Icon Factory 1.1
0242	Korean War CD
0151	Macademia CD
2541	Manhole CD
3472	Media Trks Multimedia CD
3233	Microsoft Office CD
0025	Middle East Diary CD
1970	Power Macros For Hypercard
3504	Quick Art CD
2782	Script Edit
3775	Script Expert 1.0
3775	Script Library 2.0
3505	Seals Of The U.S Govt. CD
2799	Spinmaker Plus 2.0
3492	Super Card 1.5
3508	The CIA World Factbook CD
3508	The USA Factbook CD
0243	U.S. Presidents CD
3511	Vietnam Remembered CD
2784	Xcal
Storage Devices	
Applied Engineering	
3671	3.5" 800K Floppy Drive
3672	3.5" HD 1.44MB Floppy Drive
Cutting Edge	
Mercury	
Total Systems	
Mercury	

Price	Part #	Description	Price
0036	030 16mbz (Plus)	518	
0034	030 16mbz w/FPU	675	
0043	030 16mbz (SE)	388	
0041	030 16mbz w/FPU (SE)	550	
0048	32-bit SCSI Module (Plus)	188	
0049	RAM Module	245	
0050	Mercury Kit (Plus)	95	
<i>Gemini</i>			
2902	030 20Mhz	795	
3633	030 20mbz w/FPU	995	
2903	030 25Mhz	995	
3634	030 25mbz w/FPU	1275	
<i>Gemini II</i>			
0045	030 33Mhz w/FPU	1195	
3635	030 33mbz w/FPU	1575	
0047	030 40Mhz w/FPU	1325	
3752	030 40mbz w/FPU	1850	
0051	030 50Mhz w/FPU	1595	
3638	030 50mbz w/FPU	2175	
2899	Gemkit	125	
<i>Magellan 25Mhz 040 w/PMMU & FPU</i>			
0292	Mac SE30	1995	
0291	Mac IISI	1995	
<i>SIMMS</i>			
3936	IISI 2MB (Qty 4)	680	
3428	1MB 80ns (Qty 2)	98	
3579	1MB 80ns FX	248	
3586	1MB for LaserWriter NTX	49	
0263	Maxima	44	

Part #	Description	Price	Part #	Description	Price	Part #	Description	Price	Part #	Description	Price
0643	Versa Term 4.1	86	2685	Fast Path IV	1885	3921	TX-16s 8-bit Color System	2730	3399	Mark Up - 5 Pack	517
0196	VersaTerm Pro 3.5	172	1405	NetBridge	405	0184	T-19-8-Bit Mac II	3950	3398	Mark Up - Twin Pack	257
2881	White Knight 11	84	1406	NetSerial	274	0202	T-19-8-Bit Mac IISI	3950	0148	Master Finder	49
Networking and Connectivity			2542	Telebridge	408	0204	T-19-8-Bit SE/30	3950	3225	MenuFonts 3.0	28
Asante			2985	Ethergate	1618	0205	T-19-24-Bit Mac II	5295	2189	Mockpackage Plus 4.4	31
Mac II, IIfx, IIfx, IIfx Ethernet			3167	Sitka TOPS	186	0207	QuickView Sound	282	2237	Multiclip 2.0	68
3641	MacCon + IIE	269	3429	Tops 3.0 Network Mac	186	0206	QuickView Studio	1795	2148	Multidisk	84
3642	MacCon + IIE 64	304	1089	Tops Flashcard MC	195	Megagraphics			1817	Night Watch	84
3643	MacCon + IIE 64	269	3477	Carbon Copy Twin Pack	188	0153	16" Color 8-bit Mac II	2590	3279	Norton Utilities	83
0221	MacCon + IIE 64	304	3477	Carbon Copy Mac Single	116	0154	16" Color 8-bit SE/30	2590	3779	On Cue 1.3	34
Mac IISI and SE/30 Ethernet			3992	Clear Access 1.3	350	0155	16" Color 24-bit Mac II	4890	1915	On Location 1.0.2	74
0020	MacCon + 30IE	269	3917	Dataclub 3 Pack	198	0157	19" Color 8-bit Mac II	4295	3198	On Location 1.0.2	74
3647	MacCon + 30IE64	304	3918	Dataclub 10 Pack	525	0027	19" Color 24-bit Mac II	6390	3556	Personality	48
3646	MacCon + 30IE	269	0417	E-Felp	210	0158	19" Color Scale Mac II	1875	3329	Power Icons	38
0228	MacCon + 30IE64	304	0486	GraceLAN	217	0159	19" Gray System SE/30	1895	2267	Powerstation 2.5	33
Mac SE			3975	Lap-Link Mac Release III 3.2	92	3924	Rival 19" Monochrome Mac II	1199	2194	Pyro! 4.0	24
3648	MacCon SE E	269	2215	LT 200 MC LocalTalk Board	295	3926	Rival 19" Monochrome SE	1199	3771	Quick Keys 2 Version 2.0	93
3649	MacCon SE ET	269	2214	LT 200 PC LocalTalk Board	185	3925	Rival 19" Monochrome SE/30	1199	3770	QuickKeys	33
Mac LC			3886	Mac To Mac 5 Pack	164	3378	Colorboard 208 8bit Mac II	379	2755	Quickclock 2.0	54
0029	MacCon + LC	269	3087	Mac To Mac 10 Pack	218	2627	Colorboard 264 SE/30	678	1946	Redux	48
0324	MacCon + LC MC	379	3939	MacLink Plus PC 5.0 w/Cable	128	0084	Raster Ops 24s	589	2586	Retrospect 1.2	146
0325	FNLC 10T	269	3111	MacLink Translators	108	0005	Raster Ops 24STV	1299	3805	Retrospect 1.2 w/Remote	264
10BaseT External Products			3138	QuickMail 2.2.3 (1-5 User)	209	3704	RasterOps Clearview GS/30	1692	3828	Remote 10pk	146
0327	EN/SC	359	0142	Send Express (2 Pack)	56	3662	RasterOps Clearview GS II	1692	3327	Rival	48
3885	10T Hub	989	0143	Send Express (5 Pack)	125	Sigma Designs			0116	S.A.M. 3.0	64
3945	10T MAU	99	3934	Software Bridge Mac	78	L-View Multi-Mode			3345	S.U.M. II	95
Cam Systems			Input & Output Devices			0219	LC	1475	2005	Screen Gems	38
0181	Gator Box CS	1955	Abaton			3854	Mac IIfx	1475	3522	Screen Locker	44
3118	Gator Share Software	1350	0217	LaserScript LX	1745	3853	SE/30 & IISI	1475	3354	Screen Shot	30
3117	Gator Card E/II (II Series)	458	0216	Color Scan 300	1795	3855	Gray Scale IISI & IISI	649	85	Sentinel 2.0	85
3120	Gator Mail Q (10 Users)	675	2916	Scanner 8bit GS	1495	3858	Mac II	850	2986	Shortcut	44
Dayna Communications			1507	Pro Point ADB (SE & II)	79	3856	SE	850	1800	Step Ahead 1.0	56
3546	EtherPrint	348	Caere			3857	SE/30	850	3458	Stuffed Deluxe 2.0	61
0321	EtherPrint Plus	625	3659	The Typist	478	0001	Anti-Glare Filter	79	2002	Suitcase II 1.2	48
3891	DOS Mounter 2.0	54	2158	OmniPage 2.1	494	3859	Silverview Mac II	1850	1021	SuperLaserSpool-5 Pack	298
Farellon			0120	OmniDraft	68	3860	ColorMax24	4350	1020	SuperLaserSpool-2.02	92
Ethernet			0418	OmniProof	104	2566	Sony 14" Color Monitor	825	1122	Superspool 5.0	61
3902	Ethernet Mac II Card	358	0419	OmniSpell	68	Utilities			3762	Talking Moose	23
3904	Ethernet Mac I (K10 Pk)	3258	3012	Cordless 4 Butn Cursr (Kurta)	64	3823	1 Shot Worksheet	88	3804	Tempo II Plus	104
3901	Ethernet SE/30 Card	358	3929	Dest Scanner w/OCR	685	2875	After Dark 2.05	2077	2077	Virex 3.1	56
3333	Star Controller EN 500	1588	3845	Dionix B&W Printer	398	2876	AME 1-5 Users	508	Accessories		
3475	PhoneNET Star Conn. EN	120	2935	Felix	116	2875	AME 1-10 Users	848	Basic Needs		
PhoneNET Systems - Hardware			1990	Joystick (Premium III) ADB	41	3763	APB Express Tape	58	0127	Utility Pac	15
0829	Star Controller 300 Series	824	0941	Joystick Quickstick (Plus)	41	1244	Auto Save II 2.0	26	Dust Covers		
0831	PhoneNET Repeater	313	3009	Kurta Tablet 8.5x11	318	3238	Backmatic 2.0	49	0102	IISI 13" Mon Ext. KB	17
0832	PhoneNET - DIN-8	30	3010	Kurta Tablet 12x12	384	3631	Calendar Creator	34	0104	LC 12" Mon w/LC KB	17
0828	PhoneNET - DIN-8-10 Pk	195	3011	Kurta Tablet 12x17	624	2895	Canopener 1.1	62	0404	Mac Classic w/LC KB	16
0955	PhoneNET - DB-9	30	3629	Little Mouse A+ (512/Plus)	74	3927	Cheshire 1.0	61	0100	Mac IIfx/13" Mon Ext. KB	17
2779	PhoneNET Star Connector	17	3630	Little Mouse For ADB	74	3616	Clickchange 1.03	39	0089	Mac IIfx/CI 13" Mon Ext. KB	17
2751	PhoneNET Star Conn. - 10 Pk	125	1584	Mac 101 Keyboard - ADB	128	3765	Color Mac Cheese	56	0058	Mac Plus w/Plus KB	16
PhoneNET Systems - Software			2813	Mac Pro KB-105 ADB	144	0195	ColorDex Labeling Kit	35	0132	SE w/Ext. KB	16
0827	PhoneNET Check Net	63	3306	MacTrac Trackball 512/Plus	80	0197	ColorDex Kit - 10 Pack	125	3754	SE/Plus Ext. Keyboard	16
1639	Traffic Watch	124	3305	MacTrac Trackball ADB	74	0196	ColorDex Kit - 5 Pack	61	3755	SE/Plus Std. Keyboard	16
2483	PhoneNET Liaison 3.0	258	3485	Microtek 300GS	1325	3017	Complete Undelete	50	0107	HP Deskjet/Deskwriter	11
0826	PhoneNET To AppleTalk Adapter	8	3486	Microtek 300ZS	1935	3515	Disk Doubler 3.0	44	0108	HP LaserPrinter Series II/III	15
Timbuktu			0369	Microtek 600ZS	Call	3128	Disk FINDER	24	0103	Imagewriter II	15
0420	Timbuktu 4.0	139	0370	Microtek Slide Scanner	Call	2853	Disk Express II	56	0105	Imagewriter LQ	15
0422	Timbuktu 4.0-10 User Pk	719	2740	Mousetick	64	3727	Disktop 2.0	117	0106	LaserWriter II SC/NT/NTX	17
0423	Timbuktu 4.0-30 User Pk	1429	2741	Mousetick ADB	78	3406	Disktop 4.0	62	Hardtop Covers		
0000	Timbuktu 4.0 Gold Plan 100+	Call	1390	Read II OCR 2.1	277	3407	Empower I Ver 4.0	88	0110	Mac LC KB	15
2418	Timbuktu Remote	122	2433	Read II Personal 1.1	168	3407	Empower II Ver 4.0	154	0111	Mac Std. KB	15
2827	Timbuktu Remote Access Pk	844	2561	Scanman Model 32	298	3286	Fast Back II 2.5	117	0113	Mac Ext. KB	16
2752	Remote Wakeup Mdm Cbl	31	0055	Supermouse	89	3826	Fileguard	138	0124	Outdated 101 KB	348
3474	Portable Pak	328	3326	Switchboard	58	3322	Fileguard - 5 Pack	348	0124	Imagewriter II	15
Insight Solutions			3780	Switchboard Track Ball	197	3219	Flash	124	3336	Casio Boss SF8000	89
2506	Soft PC 1.3	241	0256	TEFAx w/AutoFAX (Relsys)	869	0258	FolderBolt	58	3275	Coslar Label Writer	178
3982	Soft PC Classic	125	3232	The Complete Full-Pg Scnr	755	3339	Freedom Of Press 3.0	254	3618	Coslar Organizer	195
3282	Soft PC EGA/AT	124	3231	The Complete Half-Pg Scnr	294	1400	Gator 2.0	44	1832	Fanny Mac OT Platinum	55
3664	Access PC	61	1353	Thunderscan Power Supply	42	3561	Hand Off II	56	3991	Hot Keys	39
Nuvotech			1242	Thunderscan Plus	198	2766	INIT Manager	34	0061	HP DeskJet Cartridge	16
3119	Nuvotink II	271	0149	Tune Color - Hand Scanner	575	0282	IN Touch	35	0231	Imagewriter Ribbon - Black	3
1115	Nuvotink SC	369	1292	Turbo Mouse (512K & Plus)	107	3683	Kiwi FINDER Extender	64	0235	Imagewriter Ribbon - Blue	3
1225	Turbo Net - DB-9	19	3412	Unmouse	180	3799	Mac Kern	58	0234	Imagewriter Ribbon - Brown	6
1224	Turbo Net - DIN-8	19	3933	Voice Link	199	3799	Mac Sleuth System Profiler	85	I/O Designs - MacLuggage		
3340	Turbo Net 12 Pack DIN-8	198	3932	Voice Navigator II	570	3481	Mac Tools Deluxe	78	3905	Ultimate Classic Std KB - Black	54
1929	Turbo Net ST - DB-9	29	Video Monitors and Boards			0161	Maccess Card Reader	295	3797	Ultimate SE - Black	78
1918	Turbo Net ST - DIN-8	29	E-Machines			3533	Macinuse 3.0 Mac	58	3797	Ultimate SE - Navy	78
3341	Turbo Net ST 12 Pk DIN-8	278	3919	T-16-8-bit Color System	2095	2423	Macprint 1.2	93	3788	Ultimate SE Neon - Green	88
1226	Turbo Net-AppleTalk Adapt	6	3920	T-16X12-bit Color SE/30	2885	1296	Macsafe II	106	3789	Ultimate SE Neon - Pink	88
2184	TurboBridge	318	3922	TX-16-8-bit Color Mac II	2730	3394	Marco Polo	151	3789	Ultimate SE Neon - Yellow	88
3121	Turbo Star (Nuvotech)	825	2144	TX-16-8-bit Color SE/30	2730	3395	Marco Polo - 5 Pack	517	3793	Classic/SE - Blue	64
Orange Micro			0185	TX-16-24-bit Mac IISI	3695	3397	Mark Up	125	3907	Classic/SE - Blue	64
1435	Grapppler 9 Pin (C/Mac/GS)	86	2414	TX-16-24-bit Color System	3695	Storage Media			Sony		
2080	Grapppler Mac LS	368	Cutting Edge			0638	Bulk 50 Pack DS/DD 800K	39	2193	Bulk 50 Pk DS/DD 1.44MB	75
3015	Grapppler Mac LX	133	3304	FPD Mac II	579	2193	Bulk 50 Pk DS/DD 1.44MB	75	1158	800K DS/DD Disks - 10 Pk	12
1517	Grapppler Mac To 512K Mac	26	3303	FPD SE/30	579	2193	Bulk 50 Pk DS/DD 1.44MB	75	2192	1.44MB DS/DD - 10 Pk	12
3564	Grapppler Plus	77	0193	FPD Classic	579	2193	Bulk 50 Pk DS/DD 1.44MB	75	3109	Tape Cartridge 150MB	21
2430	Grapppler Spooler	46	Shiva			2193	Bulk 50 Pk DS/DD 1.44MB	75	2439	Tape Cartridge 60MB	19
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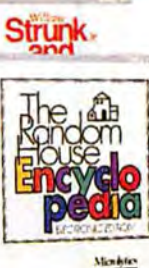
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Cool Tips from Hot Lips



When a Macintosh evangelist needs advice, he goes straight to the top: Twelve Mac gurus share their best tips ever.

I hate computer conferences. The panels are stuffed with sales-and-marketing bozos who only brag about their products and companies or expound on their visions for the future.

You seldom learn anything at computer conferences. You can, however, either kvetch or kick butt (where have I heard that before?). I prefer to kick butt, so the folks at the University of California at Santa Barbara and I created a Macintosh conference for the rest of us.

And for the benefit of *MacUser* readers, I asked the instructors to bring a little bit of the conference to you. Also, I thought that it would be a refreshing change to learn something useful by reading my column.

Power-User Voodoo. Bob LeVitus explains Mac power-user voodoo. He writes the Help Folder column (*MacUser's* "Dear Abby" for propellerheads). He also wrote *Stupid Mac Tricks*. Obviously, the instructors named their sessions by themselves.

Tip: To dismount disks (that is, eject them and make their grayed-out icon go away), hold down the Option key when you select Eject from the File menu or type Command-Option-E after you've selected the disk.

Top Drawer. George Rorick runs the Knight-Ridder/Chicago Tribune Graphics Network, the company that creates the graphics for your newspapers. He says he can teach anyone to render in-depth, full-color graphics in less than one lifetime.

Tip: To obtain greater precision with MacDraw's cursors, use ResEdit to open the CURS resource. Then select **CURSOR IDS = 256** and **259**, and redesign the cursor tools—typically, you'll make them smaller and simpler. Be sure to do this to a backup copy of MacDraw.

Stack Attack. Who knows more about HyperCard 2.0 than Danny Goodman, author of *The Complete HyperCard Handbook* and *Danny Goodman's HyperCard Developer's Guide*?

Tip: To create a new menu bar in HyperCard 2.0, you don't have to access the Authoring-menu items or their keyboard command equivalents. Instead, make a Home-stack handler that builds a menu of the most common Authoring-menu items and assign a two-character handler name to it.

All the Mac's a Stage. Marney Morris produced the Guided Tour that ships with each Mac. Her forte is real-world (that is, cost-effective, interesting, and timely) multimedia projects.

Tip: To align text or graphics onstage in MacroMind Director, create QuickDraw shapes as registration tools and then discard them when the layout is done. Also, use your tool bar or cast window for quick vertical registration.

FasterTalk. Jim Anders has installed networks for Apple, Boeing, Colgate Palmolive, DuPont, and Mobil. He says he can make LocalTalk more than a long printer cable and make a Mac talk to a mainframe.

Tip: To improve LocalTalk-network performance, don't leave the Chooser open. Active Choosers create packet traffic on AppleTalk networks. On large networks, this chews up 5 to 10 percent of the available bandwidth.

The Data Chase. Joe Kroeger, the database maven who edits and publishes *The FileMaker Report*, knows how to print catalogs and directories with FileMaker Pro and how to use FileMaker Pro and PageMaker together for database publishing.

Tip: To line up a comma in a label layout after the city field so that it prints correctly after the fields slide together (to eliminate spaces between the city name and comma), create a calculated field: **CITYcomma = CITY & ", "**. Then use the **CITYcomma** field in the label layout instead of **CITY**.

Picture That. Russell Brown is the senior art director at Adobe Systems. He knows all about getting images into a Mac—and what to do with them once they're there.

Tip: To use the tools in the Adobe Photoshop palette with greater accuracy and precision, turn on the Caps Lock key. This converts the standard tools into cross-hair tools. Now you have no excuse for ugly Photoshop documents.

Bauby Language. Tom Evslin presides over Solutions, the company that produces SuperGlue, BackFAX, FAXGATE, SmartScrap, and The Clipper. He thinks he can help people use telecommunications services without getting divorced.

Tip: To minimize E-mail charges, pick your services carefully. MCI Mail, for example, has a small monthly service fee and charges only for mail you send. It doesn't charge for receiving mail or the connect time to check if you have mail or to look up someone's address.

DTP for the Best of Us. Someday Aldus is going to figure out that it should send Olav Kvern instead of the "yellow ties" to work in its booth at Macworld expos. Olav has produced more PageMaker pages than just about anyone.

Tip: To crop imported graphics in FreeHand, paste them inside a path. Pan by selecting

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GUY KAWASAKI

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the path as points by dragging a selection rectangle over the path and then moving the path. If you select the whole path, the image will move as you move the path. But if you select points in the path, you can move the path without moving the image.

Easy Hardware. Charlie McConathy, the president of MicroNet Technology, has the art of buying, maintaining, and configuring Mac hardware down pat. He explains mysterious topics such as external-hard-disk data errors caused by the RFI (radio-frequency interference) of fluorescent lights.

Tip: To eliminate RFI problems, use double-shielded, twisted-pair SCSI cables. Make sure that all the cables have a separate drain line running the entire length of the cable and that the shielding connects directly to the metal shell of the connectors at both ends of the cable.

Drawing Conclusions. Ron Chan is the designer who created the illustration on the MacroMind Director box — the one with the guy in the white shirt holding a megaphone. His stuff is so beautiful that he makes Illustrator owners wonder if they are using the same software he is.

Tip: To make joining the endpoints of an open path easier, Option-select anywhere along the path and then use the Join command. This way, you don't have to go through the trouble of selecting both endpoints of the path.

Bulletproof. Robin Williams knows document design. Her shtick is to forever change the way you visualize and produce a printed page. She should know — she wrote *The Mac Is Not a Typewriter*, *The Little Mac Book*, and *PageMaker 4: An Easy Desk Reference*.

Tip: To get rid of those boring Option-8 bullets, use Zapf Dingbat characters such as a tiny triangle, ▼ (press T), or a diamond, ◆ (press U). To make these bullets subtler, raise their placement above the baseline by superscripting them.

Great Expectations

I hope you find these tips helpful, because even if you can't be there, there's no reason to be square. And I hope I've raised your level of expectation for the other computer conferences you attend. ☞

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Of Mice and Pens



Is the mouse holding back the Mac? Apple may be making some tough choices soon.

There are moments when the technological winds gather with ambiguous force, like a leopard crouching either to spring or to slink away.

The pressures to slink are understandable. Without minimizing the travails of the coal seller in Newcastle or the refrigerator drummer on the Nome beat, it is sometimes simpler to sell the already sold (preach to the converted, run as the incumbent, make a computer sale to a computer owner) than to explore new territory.

But sometimes the leopard does spring. Pen-based computing looks like the leopard of the moment. Here's what the spring may bring.

Wait Your Turn

Every successful input device knows that you don't get ahead by making the boss look stupid. The winning input device is bandwidth-savvy: It presents data to its processor as fast as the processor can handle it, and no faster.

Consider the typewriter keyboard. Laid out one way, it would've allowed expert typists to transcribe text faster than the machine could move its type bars, resulting in embarrassing jams. Laid out another way, it would slow down the typist enough to keep the typewriter mechanism from looking stupid.

It was the second layout that succeeded, and it was so successful that it has survived long after the problem it was designed to dodge was solved.

Consider the mouse. Like the typewriter keyboard, the mouse limits the user. Rather than providing the precise fingertip control of, say, a pen, the mouse has to be controlled by the wrist. Rather than providing direct feedback to the user about its current position, the mouse hides its x,y positioning device under its body, which is hidden in turn under the user's own hand.

There were reasons for these limitations. The mouse has to talk fast, keeping the processor informed almost continuously of its changing position. This gobbles up processor bandwidth, so trade-offs were necessary in the design.

The mouse's inventor, Doug Engelbart, has explained more than once how he and his colleagues tested the mouse against various other devices and concluded that the mouse was the best pointing device they could find.

Not the best drawing, writing, or graphical-input device, but the best pointing device.

Engelbart was a pioneer in viewing the computer as a tool for augmentation of the human intellect, so it may seem odd that of the various faculties of the human mind, the one his group sought to enhance was pointing.

But it was the right thing to do, because it solved the problem at hand. It's good to reflect on what that problem was, because it's not the problem pen-based computing addresses. Engelbart and company were constructing an abstract space of simple objects, displayed on a screen, envisioning what today is called a graphical user interface. All the present-day computer GUIs, including the Mac desktop and Microsoft Windows, owe their existence to Engelbart's imagination.

This abstract environment created a need that did not exist before: the need for a way of pointing physically at nonphysical, abstract entities. This is the highly artificial problem the mouse solved. Because it was designed for pointing in this abstract space, direct feedback on the mouse's absolute position was irrelevant. You don't look at the mouse or the desk surface it's touching; you look at the screen for your positional feedback.

Perhaps the graphical application program bundled with the original Mac should have been called MacPoint.

Cursors Foiled

Pen-based computing is a different model, with a different level of abstraction, different demands on the processor, and a different "feel." One small clue that this model will produce a different sense of interaction lies in the fact that pen-based computing does away with the need for a cursor.

The basic idea is not new. Take Alan Kay's Dynabook and other models for a notebook-sized computer you use like a notebook, walking around with it under your arm, writing on it with a penlike input device—the idea has been around longer than the mouse.

Some pieces of the necessary technology have been around for a long time too, and some are just now arriving. It's clear to a lot of people who are investing a lot of money in pen-based hardware and software that enough of the pieces are now in place. The moment is upon us.

The Pen Is Mightier . . .

If it's not the same thing as mouse-based computing, then what is pen-based computing?

Probably we will learn what pen-based



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computing is only after people begin using it. This much is clear: When you use a stylus or a pen device to write or draw or point directly on the display, your expectations change. You begin to use the device as though it were a pen, and you expect to be able to do with it anything you can do with a pen (and more).

You expect to be able to scribble notes in margins, cross things out, annotate, doodle, and especially write. Handwriting recognition is accepted by the developers of these machines as a required feature. It's a fundamental part of the spec, as it were.

Who will use the machines? One observer, software developer Ray Valdes, identified three categories of users of these systems in the first issue of *Pen-Based Computing* (Stylus Publishing, P.O. Box 876, Sandpoint, ID 83864; [208] 265-5286).

One category is people who need to do data entry at remote sites, such as those who issue parking tickets or warehouse workers who enter information on a loading dock. Then there are those needing to access data remotely, such as an architect on a building site or field engineers troubleshooting at a customer site. Finally, there are people who need to interact with data from a remote site — such as Realtors and paramedics — perhaps entering and retrieving data remotely, perhaps performing data analysis remotely.

All of Valdes' categories involve remote use. I think there may initially be other, non-connected users: doctors on rounds, downloading patient data from a minicomputer before and uploading it after their rounds, for example. But a wireless link to other computers is also part of the spec.

And other kinds of users will take to pen-based computing as it improves. It really is too bad that the words *paint* and *draw* have been squandered on computers and software that can't do either. Until you use a pen-based machine, you don't realize how inappropriate a mouse is as a graphical-input device. Pen-based computing has the potential to provide decent sketch pads for artists as well as notebooks for the rest of us.

Claw Marks

We've got the hardware to make the machines work, and we've got a choice of software implementations. Some spring, some slink.

One approach is to start from scratch. GO Corp. is the most visible company

taking this approach. GO has developed PenPoint, a new 32-bit, multitasking, object-oriented operating system specifically developed for pen-based systems, intended to be processor-independent, with handwriting recognition wired in, and employing the visual metaphor of a notebook with tabs.

The idea is that hardware vendors will license PenPoint for their notebook computers and that software developers will write or port applications to PenPoint.


Another approach is to build on entrenched technology. Here the idea is to let software vendors modify existing software to work with pen-based input or develop new applications that can work with either conventional or pen-based systems.

Microsoft is pursuing this approach with PenWindows, a version of Windows that will support handwriting recognition and other pen-based features.

Which strategy will succeed? Microsoft certainly has the quick-start edge. PenWindows turns pen gestures into keyboard or mouse messages, which Windows already knows how to deal with. This makes it easier to make an application pen-friendly, but it doesn't provide much opportunity to exploit any features that make pen-based computing a revolutionary step forward. And of course it isn't very interesting to Mac users.

In the long run, I think the GO strategy will succeed. Microsoft's approach seems too much like the QWERTY typewriter-keyboard layout, deliberately hobbled to fit within the constraints of present-day technology. But the present-day technology Microsoft can't escape is the installed base of DOS machines, which hobbles Windows and now threatens to hobble pen-based computing.

"Hobble" may be too harsh. If pen-based computing is an incremental step, then Microsoft's approach is probably the right one. I can't prove that it's a revolutionary step, that it requires a leap of faith or nerve or imagination. But my sympathies are with the leopard that takes that leap into the unknown, like Hemingway's in *The Snows of Kilimanjaro*:

"Kilimanjaro is a snow-covered mountain 19,710 feet high, and is said to be the highest mountain in Africa. Its western summit is called by the Masai 'Ngàje Ngài,' the House of God. Close to the western summit there is the dried and frozen carcass of a leopard. No one can explain what the leopard was seeking at that altitude." 

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MacUser March 1990



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Publish March 1990

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The totally redesigned ScanMaker 600Z offers higher resolution for a lower price.

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MACWORLD

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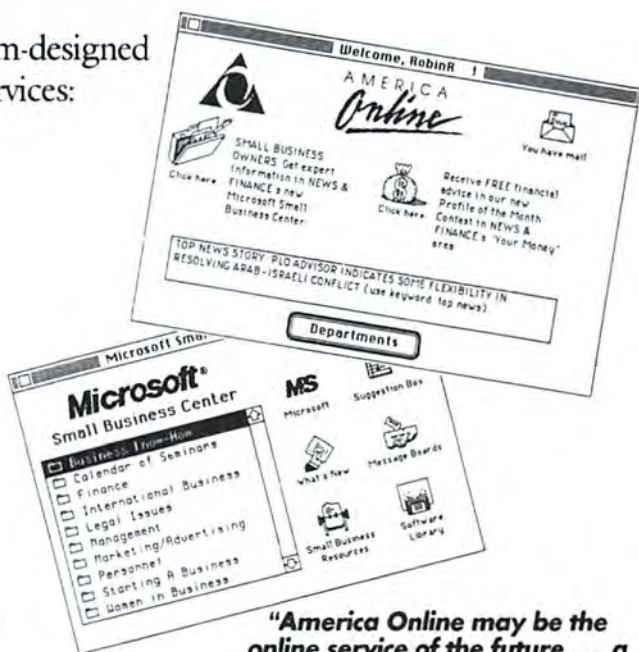
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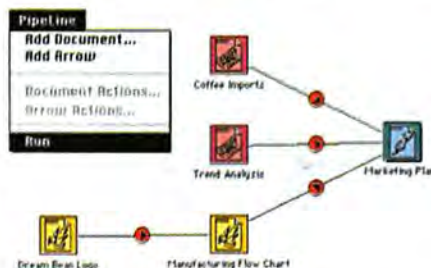


NEW ON THE MENU

Insecurity software: With all the concern about data security, it had to happen. New Visions ([405] 523-1639) has started shipping MasterKey — the first commercial antipassword program. Designed to “recover” passwords from Excel, WingZ, and WordPerfect files, MasterKey is intended to unlock protected data. New Visions says it has found a market with the IRS and drug-enforcement agencies. We won’t speculate about how many tax cheats and drug dealers use Excel.

By Russell Ito

Two faces of 7.0: By now you’ve probably heard enough about System 7.0 to bite the bullet and try the darn thing, but there’s more to System 7.0 than meets the eye. ➤ Publish-and-subscribe lets you link data from various documents, but because subscribing files can themselves be subscribers to other files, keeping things straight can be a chore. Claris ([408] 987-7000) has come up with a solution, a technology it’s calling PipeLine. With PipeLine, users can open schematiclike drawings of linked documents that clearly depict all the interdependencies. In addition to seeing all the various file locations, sizes,



and types, users can launch any part of a document by double-clicking on the appropriate icon and then updating all or part of the composite file by “running” the PipeLine window, which automatically launches each of the applications involved. Claris expects to turn PipeLine into a product sometime in early 1992.

➤ And then there are Apple events. ASI (Articulate Systems, Inc. — [617] 876-5236) is already demonstrating what’s possible. If you’ve ever tried to trash a file on a desktop full of windows, you know how much easier it would be just to say “Trash it” rather than dig through all your windows trying to get at the Trash icon.



Likewise, if you’ve ever tried adding borders to a Word 4.0 table, you know that it involves two dialog boxes, a button, several mouse clicks to pick your borders, and finally two OK buttons. Imagine how much easier it’d be just to say “Borders” and go to the appropriate dialog box. Until now ASI’s Voice Navigators have been limited to mouse clicks and cursor locations, but Apple events make direct commands possible (ASI is already demonstrating the Finder functions; Word is still a gleam in its eye).

➤ Whether you can see the differences or not, you can bet that System 7.0 will change the way you work.

Up to Date . . .

FileMaker Pro 2.0 fixes several bugs, including printing problems with the HP DeskWriter and GCC PLP printers and problems converting FileMaker II files to FileMaker Pro. \$299. (408) 727-8227. ➤ MacMoney, Survivor Software’s personal-finance package, is now in version 3.52 and imports SYLK files and data from CheckFree, Dollars & Sense, Quicken, and the WristMac. (213) 410-9527. \$119.95. ➤ DynoDex, Portfolio Systems’ personal-info manager, has been bumped up to version 2.0. Enhancements include mailing-label and envelope printing and more formatting options. (914) 876-7744. \$125. ☞



Dynamac, the original Mac repackager, has adopted the LC as its new base motherboard, producing an LC-based portable. It has also introduced a line of LC add-ons, including a flat-panel display.

Dynamac's Back

If you've ever held a Mac Portable in one hand and an LC in the other, you've probably thought that the LC would make a great portable. Apparently Dynamac, the creator of the first portable Mac, thought the same thing, because it has used the LC motherboard as the basis for a new portable and a line of accessories.

The Dynamac IIIsf is a leather-cased portable with an LC motherboard and a 640-x-480-pixel, 16-gray, backlit, flat-panel display. It includes a touch pad, has a battery life of three hours, and comes with 2 megabytes of RAM and a 40-megabyte hard-disk drive. The IIIsf can drive Apple's 12-inch RGB and monochrome displays. Unfortunately, the IIIsf is only about four pounds lighter than the Apple Portable.

Dynamac also packages the IIIsf in a 16-megahertz 68030 configuration (the IIIsf/30) that includes a 68882 math coprocessor, a 2,400-bps data modem, a 9,600-bps send/receive fax modem, and 4 megabytes of RAM. Its battery life is double that of the IIIsf.

Dynamac's LC accessories include the LCDisplay, a backlit, 16-gray, 640-x-480-pixel, flat-panel display; the LCPower, a 16-megahertz 68030 enhancement card with a 68882 math coprocessor; and the LCPortable, which turns the LC into a battery-operated 16-megahertz 68030 portable equipped with a 68882 math coprocessor.

Dynamac Computer Products, Inc., 555 17th Street, Suite 1450, Denver, CO 80202; (800) 234-2349 or (303) 296-0606. IIIsf, \$4,995; IIIsf/30, \$6,995; LCDisplay, \$1,299; LCPower, \$399; LCPortable, \$1,999.

HP Enhances the IIP

Keeping in step with the trend toward higher-quality, lower-cost printers, Hewlett-Packard has announced the LaserJet IIP, an improved version of the LaserJet IIP.

The LaserJet IIP adds the same resolution-enhancement features as are found on HP's LaserJet III and IIID printers plus a faster processor than that of the IIP (16 megahertz instead of 10). The IIP also includes twice as much memory as the IIP (1 megabyte versus 512K). PostScript is still available through a cartridge. Users configuring the IIP for the Mac have to add another 1 megabyte of RAM plus an AppleTalk interface.

For those on a budget, HP will continue to sell and support the LaserJet IIP.

Hewlett-Packard Co., 19310 Pruneridge Avenue, Cupertino, CA 95014; (800) 752-0900. \$2,795 (includes PostScript cartridge, additional RAM, and AppleTalk interface).

Schedule+ Extends Mail 3.0

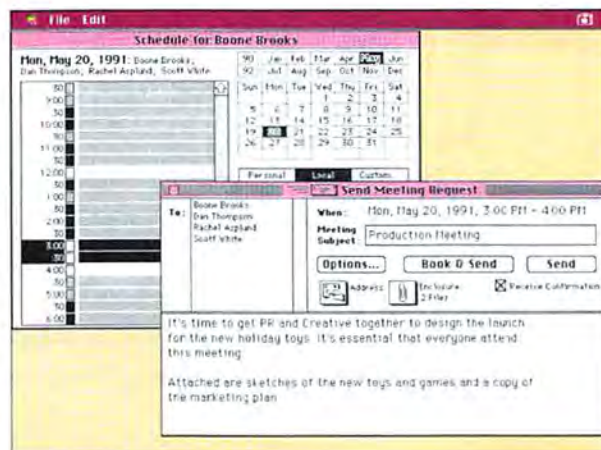
Most businesspeople divide their days between two tasks: attending meetings and setting them up. With this in mind, Microsoft has introduced its first add-on to Mail 3.0: Schedule+, a multiuser scheduling package.

With Schedule+ you can maintain personal calendars, alarms, and reminders; share your calendar with your coworkers; and easily schedule meetings. Using shared calendars, you can see when people and facilities are available and then propose a meeting. When the recipients book the meeting into their calendars, Schedule+ sends a confirmation back to you and books the meeting in your calendar.

Because Schedule+ is closely integrated with Mail 3.0, all the functions you'd expect to have in your E-mail system are still available. For example, when you propose a meeting, you can enclose an agenda or other files, just as you would in a normal mail message, and all your meeting messages arrive as part of your usual E-mail. Plus, as far as the network administrator is concerned, Schedule+ is just another Mail 3.0 form — not another application — so it doesn't increase the administrator's work load.

Schedule+ uses the same database as Microsoft Mail 3.0 does, so all the gateways, directories, and groups you can access through your Mail server are available in Schedule+. At your local station, you have a variety of personal calendar tools, including searching; notes; and the ability to print your schedule in different formats, even as a daytimer.

Microsoft, One Microsoft Way, Redmond, WA 98052; (206) 882-8080. 5-user pack, \$195; 20-user pack, \$775.



Microsoft Schedule+ is the first add-on for Microsoft Mail 3.0. It's a multiuser scheduling package that automates the tedious process of arranging meetings and helps you keep your schedule straight.

Claris' New Line

With Claris back inside the Apple fold, it was predictable that the company would be the first on the market with a full suite of System 7.0-friendly applications. Claris took the opportunity of the System 7.0 rollout to introduce upgraded versions of MacProject II and HyperCard plus two major new releases: Resolve, a spreadsheet program based on technology Claris purchased from Informix (WingZ), and MacWrite Pro.

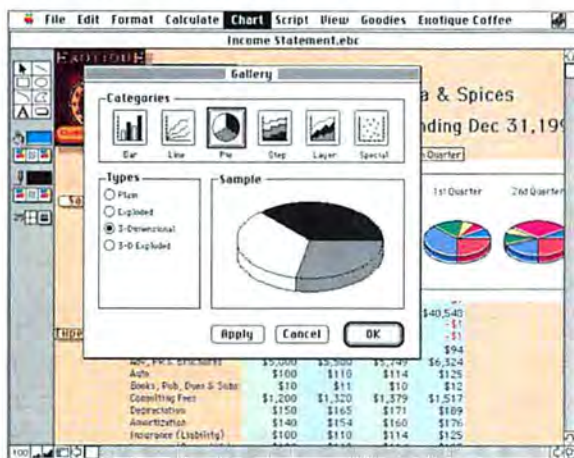
Resolve, which was designed specifically for use under System 7.0, can produce spreadsheets containing more than 1 billion cells. It supports publish-and-subscribe as well as standard and custom Apple events.

As you'd expect from a WingZ relative, Resolve includes strong graphics and scripting features. Its programming language lets you create custom applications that include menus, dialog boxes, and buttons, and its charting option lets you choose from 25 kinds of charts, including

various 3-D types. The program also includes a MacDraw-like drawing environment for adding graphics to spreadsheets and charts. Expect to see Resolve this summer.

MacWrite Pro is virtually a rewrite of MacWrite II, with more than 130 new features. Among the most important changes is the adoption of a plug-in (Claris calls it an ADDit) architecture that lets users add abilities just by dragging an ADDit file into a folder. MacWrite Pro will ship with two ADDits, one for creating tables and another for adding "Post-it" notes (either text or sound) to a document. MacWrite Pro includes style sheets for characters and paragraphs, and you can even assign a foreign language as a style, which lets you check the spelling of an entire document without switching dictionaries. Expect to see MacWrite Pro this summer.

Claris Corp., 5201 Patrick Henry Drive, Box 58168, Santa Clara, CA 95052; (408) 727-8227. Resolve, \$399; MacWrite Pro, \$249.



Resolve is Claris' entry into the spreadsheet market. Based on technology purchased from Informix, Resolve resembles WingZ.



MacWrite Pro is virtually a rewrite of MacWrite II. Claris has adopted plug-in tools it calls ADDits as a way to extend functionality, such as the ability to create the table at the top of the screen.

NewsLine

Reports and Analysis

FTC Widens Microsoft Probe

REDMOND, WA — Confirming a rumored Federal Trade Commission investigation, Microsoft has acknowledged that the FTC is investigating the software giant's competitive practices relating to its three operating systems (DOS, Windows, and OS/2) and the Microsoft Mouse. The probe focuses on whether or not Microsoft monopolized — or sought to monopolize — the market for these products.

Sierra Merger Off

SAN RAFAEL, CA — Barely three weeks after Sierra On-Line announced its intention to acquire Broderbund Software, Sierra and Broderbund canceled the deal. The reason given for the merger's collapse was disagreement between the principals over the management structure of the combined venture.

Pixar Not Animated

RICHMOND, CA — Two months after attempting to spin off its software operations, Pixar has laid off roughly half of its employees and the future of the software venture seems grim. Pixar had hoped to attract venture capital to fund the software operation, but the funding hasn't been forthcoming and the company has now decided to cancel the release of Showplace, its 3-D-composition package. Pixar is currently negotiating with several software companies about licensing Showplace for distribution.

Claris Gets a CEO

SANTA CLARA, CA — Six weeks after Bill Campbell left Claris to become president and CEO of GO Corp., Apple, Claris' parent company, named Daniel Eilers, Apple's Vice President for Strategic Planning and Corporate Development, as president and CEO of Claris. The 35-year-old Eilers was with Apple for nine years, having joined the company as software manager for the Lisa.

Lotus Gets Mail

MOUNTAIN VIEW, CA — Lotus Development has announced plans to buy cc:Mail, the maker of the popular E-mail package of the same name for the IBM PC. Although the Mac version of cc:Mail hasn't been a big success, cc:Mail is the leading E-mail package overall, holding some 30 percent of the market. Although the financial terms were not disclosed, analysts estimated that Lotus Development probably paid less than \$25 million for the company.

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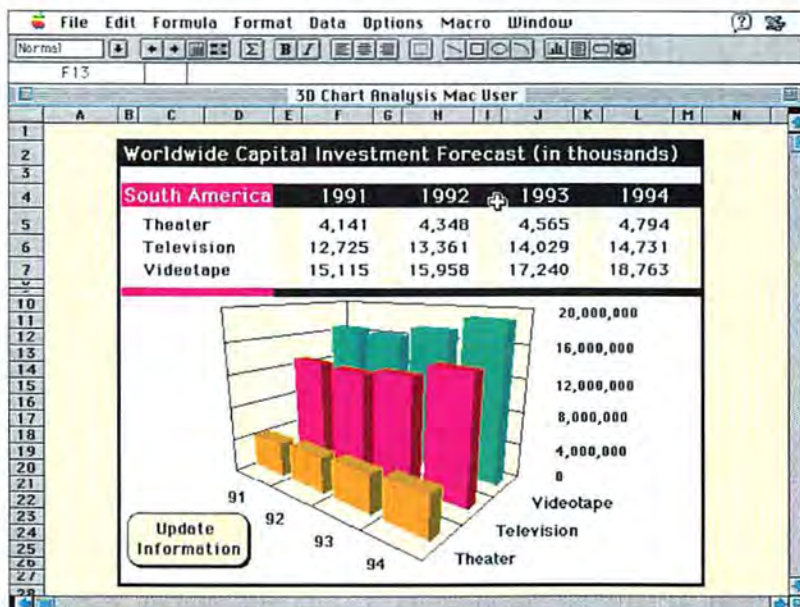
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COMPUTING FROM DIGITAL.

SPREADSHEETS

Microsoft Excel 3.0

The latest version of Microsoft's popular spreadsheet program delivers new and improved features for novices as well as power users.



Enhanced charting in Excel 3.0 includes new 3-D-chart options. The tool bar beneath the main menu bar is also new to Excel, although it will look familiar to users of Ashton-Tate's Full Impact spreadsheet program. Each button activates commonly used spreadsheet functions, such as formatting cell contents in boldface or italic type.

Excel 3.0 is more than just an upgrade of the most popular spreadsheet program for the Mac. Innovative new tools boost Excel's data-analysis power, and the program's presentation-quality output gains more polish. But best of all, these considerable enhancements haven't decreased the program's accessibility. In fact, the new version of Excel is easier to use than its predecessors.

One-Stop Tool Bar

The first readily apparent change to Excel is the new tool bar, which extends beneath the main menu headings. The tool bar provides handy, one-stop shopping for commonly used spreadsheet functions. For example, rather than requiring several steps to sum a row or column of numbers, Excel 3.0 lets you click once on the Autosum button. Autosum is smart enough to analyze your data and select the numbers

either above or to the left of the active cell for summation. With tool-bar functions, you can also set cell formatting and alignment, position a chart, add a text block, or use a marquee to select graphics objects in a worksheet.

An innovative addition is Excel 3.0's outlining capability, which lets you outline your data much as you outline text with a word processor. If you have many levels of information on a worksheet, for example, you can organize it hierarchically so that detail data is subordinated to the corresponding summary rows. You can organize your data outline manually, or you can let Excel automatically create the appropriate categories and subcategories of a selected range for you—which it does very well. The program supports eight levels of outline in all.

Once you've created an outline, you can expand and collapse it to show the

various levels of detail, using the outline icons. This provides a terrific method for quickly and easily creating a variety of summary reports.

A host of other improvements to version 3.0 make Excel more accessible to novices and more convenient for power users. If you've ever fussed with sizing column widths for a worksheet, for example, you'll welcome the way version 3.0 handles sizing. You double-click on a column border, and Excel then finds the widest element in the column and sets the width accordingly. You can even highlight multiple columns that require different widths, and Excel will set them all to the correct size automatically.

If you've ever miscalculated the number of rows or columns needed to accommodate the data before pasting it in to your worksheet, you'll appreciate a new option that creates the appropriate number of cells automatically.

Another handy feature is the Add button in the Define Names dialog box, which lets you define range names more quickly than you could in earlier versions. However, although you can drag the dialog box around within the worksheet to get a better view of the ranges you're looking for, you can't actually select ranges from within the worksheet while you're accessing the dialog box. This means that most range names created by use of the Add button are likely to refer to simple ranges or constants.

Excel 3.0 no longer makes you plod back and forth from Print Preview to your worksheets in order to fine-tune the final appearance of your worksheets. In earlier versions of Excel, Print Preview let you view documents but wouldn't let you make any changes to them. The new Print Preview lets you change column widths and set margins without returning to your worksheet.

3-D Charts

Excel was the first spreadsheet program to integrate a solid charting tool, and the new version continues to build on this strength. There are 24 new 3-D-chart options in version 3.0, including area, column, line, and pie charts.

With version 3.0, you can at last combine text, worksheets, and charts on a single page, as well as place more than one chart on a page, to create truly informative reports.

The program also provides drawing tools for creating lines, arrows, rectangles,

ovals, and arcs on worksheets. Graphics objects created with Excel's new drawing tools are attached to the underlying cells. This means that when the cells shift, the objects move or change size with them. You can also choose to detach objects from underlying cells if you don't want them altered.

In Excel 3.0, you can use pasted graphics as chart units, stacking or stretching the graphics to fit the corresponding data. You can even play with your data graphically by altering charts with the mouse. Results are reflected in the corresponding worksheet.

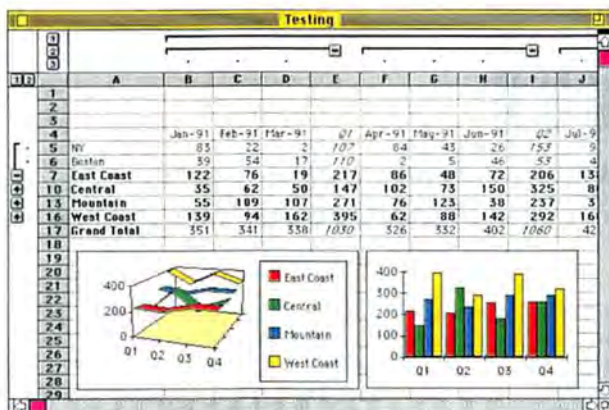
Excel 3.0 has style sheets that mimic those of Microsoft Word. You can name combinations of number format, font, alignment, border setting, pattern setting, and cell protection and then apply those settings without repeated returns to the Format menu. A nice finishing touch is a button that lets you copy any predefined style into the current worksheet.

Version 3.0 delivers several enhancements specifically designed for power users. If you've been waiting for a way to consolidate your worksheets, for instance, the wait is over. With Excel 3.0, you can combine data from an unlimited number of worksheets as well as from different ranges within the same worksheet. You can also consolidate by using links that update your summaries as you edit values. Excel even consolidates worksheets with different row and column positions, as long as they have consistent labeling.

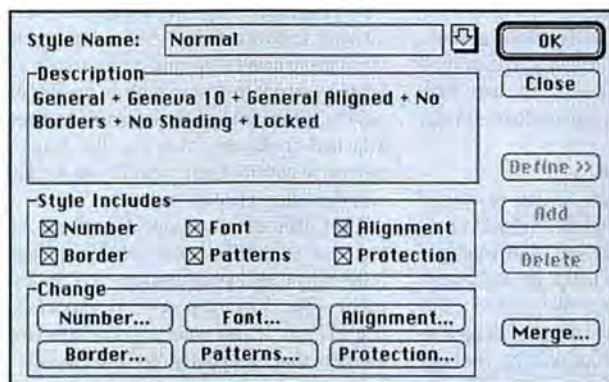
For what-if analysis, Excel 3.0 supplies a powerful new tool called the Goal Seek function. Goal Seek lets you calculate the input values necessary to drive a formula to a specified value without making you use trial and error. For example, the function can provide the monthly sales revenues needed to maintain a 6-percent profit margin when your monthly overhead is \$1,800.

The separate Solver application takes Excel's analytical powers even further. The Solver calculates solutions to problems that use multiple variables based on the same formulas. For example, you can use the Solver to calculate a quarterly advertising budget that optimizes profits for the year.

For those who depend heavily on macros, version 3.0 offers several useful improvements. Perhaps the most significant is the ability to create a startup folder for Excel. You can create a special macro sheet named Excel Startup that loads



Excel 3.0 lets you outline your data and then collapse and expand it to create various summary reports. Here, data for all regions except the East Coast is collapsed. Version 3.0 also lets you combine numbers and charts on the same page.



Excel 3.0's formatting controls are powerful. New style sheets let you format your worksheets much as you do documents in Microsoft Word.

whenever you launch Excel. There's also a new macro-sheet format called Add In that opens macro sheets invisibly and adds their functionality to Excel, just as if they were built in.

Setting Up

Excel 3.0 and all its support files require more than 4 megabytes of disk space for installation. Fortunately, you don't have to install everything. If you're an experienced user, for example, you can save 770K by not installing the program's tutorial.

Excel's documentation is better organized this time around, so it's easier to find what you're looking for. The Help system is also effective, but unfortunately it loses its place as you navigate through it: Click on a topic, read it, and press the Back button, and the first topic in the list is highlighted rather than the section you just completed.

You also can't print the Help screens from Excel. Although this may be environmentally correct, it can be truly frustrating, because you can't leave the Help screen open as you try out the prescribed steps.

The Bottom Line

With the addition of the tool bar and numerous other interface enhancements, Excel 3.0 succeeds in being more accessible to novices and more convenient for experienced Excel users.

Moreover, unique features such as the Solver and the outliner provide functionality that no other Mac spreadsheet program offers. The long wait for significant Microsoft Excel upgrades can often be frustrating — version 3.0 was in the works for almost two years — but the result is well worth the wait. Each new version of Excel has included impressive, innovative features. Excel 3.0 is no exception.

— Louis E. Benjamin, Jr.

Get Info

Microsoft Excel 3.0

Published by: Microsoft Corp.,
One Microsoft Way, Redmond,
WA 98052; (206) 882-8080.

Version: 3.0.

List Price: \$495.

DRAWING AND PAINTING

FreeHand 3.0

A streamlined interface and snappier response mark the new version of Aldus' powerful illustration package.

Choosing between FreeHand and Adobe Illustrator has never been easy, and FreeHand 3.0 makes the choice even more difficult. Faster screen redraws make the new version more responsive than previous versions. And although FreeHand may not offer as many extra features as Illustrator does, the new version's streamlined interface makes it easier to use than Illustrator in all areas except text editing.

More Palette-able

FreeHand 3.0 builds on the powerful base of version 2.0, which offered auto-tracing, freehand drawing, and multiple undos and redos of up to 99 previous steps (see Quick Clicks, June '89, page 45). But rather than add a slew of new features to version 3.0, Aldus has wisely concentrated on making it easier to use FreeHand's existing features, by improving the program's interface. Three new palettes

— Layers, Colors, and Styles — play a key role in this effort.

Perhaps more than any other enhancement, the new Layers palette improves FreeHand's functionality and ease of use. The program's layering functions were already renowned, but Aldus has made them more accessible and easier to use by letting you control them with an on-screen palette. Once image elements have been attached to layers, you use the Layers palette to control their visibility as well as whether they print or not.

One decided advantage FreeHand 3.0 has over Adobe Illustrator is that FreeHand 3.0 lets you edit your drawing in Preview mode. The Layers palette is especially useful here. If you want to edit a drawing element that is partially obscured by other layers, you can make the other layers invisible simply by clicking on the check marks next to their names in the Layers

palette. You can also click through objects to select underlying layers by holding down the Option key when you click.

The new Styles palette provides a fast and easy way to name and edit selected line and fill styles without numerous trips to the menu bar. You apply the styles simply by selecting objects and then clicking on the appropriate style name on the Styles palette. The convenience of this approach is obvious when you consider how complex styles can be. For example, a style called My Arrow could be a 3.5-point line with a red fill and an arrowhead pointing right (predefined arrowheads are also new). Editing this style is as easy as double-clicking on its name on the palette and adjusting the settings in the resulting pop-up dialog box.

Version 2.0 forced users to plow through multiple menu commands to create and apply colors to elements, but FreeHand 3.0 uses an on-screen palette of colors that's always accessible. The palette displays a swatch of each color for reference. Version 2.0 supported all standard color systems—Pantone, spot, and process—and the addition of the Colors palette makes it easier to assign, edit, and name colors.

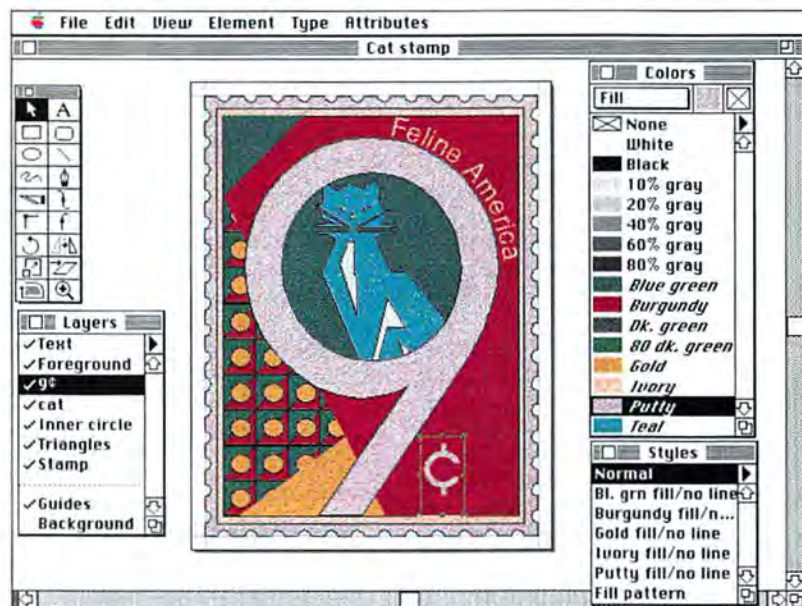
Too Easy

At times, you may find that the palettes make it *too* easy to assign styles or layers to objects. The manual wisely advises users to get into the habit of pressing Tab (which deselects all objects) before switching layers, to avoid accidentally moving selections to new layers. Another problem is that it's too easy to click on the check mark (which makes a layer invisible) rather than the layer name (which makes the layer active).

Also new in version 3.0 is the ability to display, separate, and print 32-bit TIFF images. For high-end color processing, you can now create color EPS files that are compatible with the OPI (Open Prepress Interface) system, which includes systems made by Linotype-Hell and Crosfield.

Unfortunately, the new version offers no improvement in FreeHand's text editing. You must still use a dialog box to enter and edit text. Illustrator 3.0, on the other hand, no longer uses this cumbersome method.

Several new text enhancements are worth mentioning, however. You can now convert Adobe Type 1 and Fontographer Type 3 fonts to fully editable outlines, as long as the downloadable font file is in



FreeHand 3.0's new palettes make controlling the program's color, layer, and style functions faster and easier. This drawing has nine layers listed in the Layers palette, two of which (Guides and Background) are nonprinting. You can hide or show a layer just by clicking on the check mark next to its name.

your System Folder. Another improvement is that you can display PostScript text effects such as zoom and shadow. Most programs make you wait until you print to see these effects. The new version also lets you improve screen-redraw performance by specifying "greek" text. Still lacking, however, are sophisticated text-handling features such as Illustrator's text-block linking.

Get With the Group

FreeHand 3.0 makes it easy to deal with grouped objects. For example, you can apply styles, fills, lines, colors, and type attributes to a group. Even better, you can use Option-click to select a member of a group without first ungrouping. For some users, this feature alone is worth the upgrade price.

Aldus has also improved the program's performance by eliminating the annoying flicker that occurred in previous versions whenever you dragged objects across the screen. In addition, the program also delivers more precision: You can now specify object placement in increments as small as $1/10,000$ of a point.

The user guide and tutorial manual are excellent. The documentation includes a 70-page booklet on using FreeHand for commercial printing and an 8-page card on color trapping. New context-sensitive on-line help is another welcome addition to FreeHand 3.0.

There is a small price to pay for the improvements in FreeHand 3.0: The program no longer runs on 1-megabyte machines. The minimum configuration is 2 megabytes of RAM, although Aldus recommends 4 megabytes.

The Bottom Line

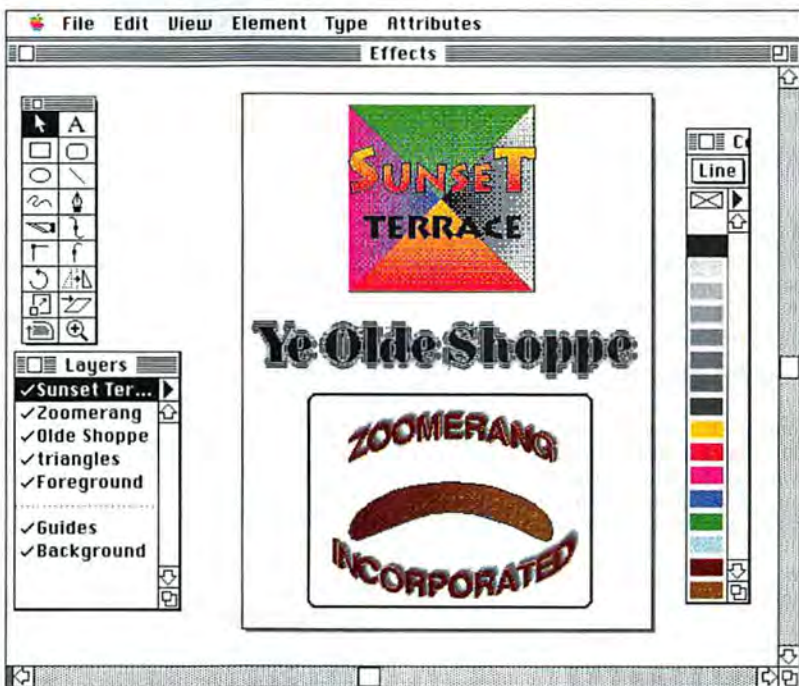
It's a refreshing change to see a software developer avoid the features war and concentrate instead on maximizing the functionality of existing tools. FreeHand 3.0's time-saving palettes are a welcome

addition that sharpen the effectiveness of the program's layering, color, and style functions. In addition, version 3.0 offers improved performance and precision that place it on a par with the Mac's other premier illustration package, Adobe Illustrator. Although Illustrator's text-handling features continue to surpass those of FreeHand, only FreeHand offers

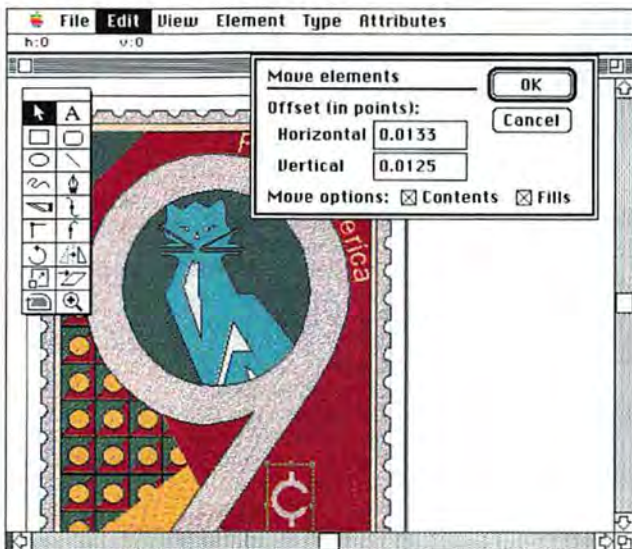
designers and illustrators the convenience of editing in Preview mode. Illustrator, on the other hand, still requires separate windows for drawing and previewing.

All in all, no FreeHand user should be without version 3.0. And Illustrator users should give Aldus' package a long, hard look to see what they're missing.

— Dave Valiulis



A FreeHand forte has always been the provision of full editing power even while you're previewing — something Illustrator has yet to offer. This figure illustrates some of the advanced on-screen text effects available in the new version.



More-precise placement and scaling of objects is an important addition to FreeHand 3.0. The program provides precision to $1/10,000$ of a point for improved accuracy.

Get Info

FreeHand

1111 1/2

Published by: Aldus Corp., 411
1st Avenue S., Suite 200, Seattle,
WA 98104; (206) 628-2320.

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


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
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
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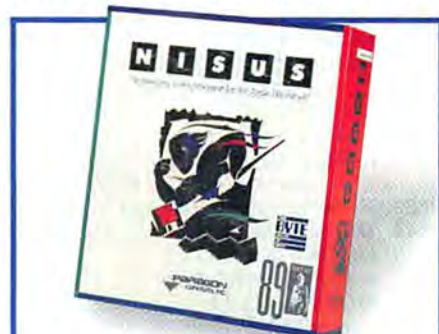


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7085 *FileGuard Extended 2.5.2*—Protect your hard drives, applications, files/folders (including system folder) from unauthorized access, deletion, and/or illegal copying. Now with system usage audit trail. 5 & 10 user also available. ... \$139.

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5166 *SmallTalk/V Mac 1.1* ... 123.

Dubl-Click Software

7974 *ClickChange 1.04* ... 56.

1824 *Calculator Construction Set 2.09.6* ... 62.

★Fifth Generation ... 30 day MBG

4287 *PYRO! 4.0* ... 25.

3955 *⑦Suitcase II 1.2.9* ... 49.

8284 *SuperSpool 5.0* ... 62.

8286 *SuperLaserSpool 2.02* ... 93.

5178 *⑦FastBack II 2.5* ... 118.

5725 *DiskLock 2.0* ... 118.

★Hyperpress ... 30 day MBG

4233 *Icon Factory 2.0* ... 56.

ICOM Simulations

4084 *On Cue 1.3* ... 35.

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6171 *MacPrint 1.23* ... 93.



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★JAM Software USA ... 30 day MBG

6089 *Smart Alarms 3.03 w/Appt. Diary 3.1* \$63.

6088 *Smart Alarms 3.03 (1-4 users)* ... 125.

★Kent Marsh Ltd. ... 30 day MBG

5457 *QuickLock 2.0* ... 34.

9513 *FolderBolt 1.01* ... 73.

2591 *The NightWatch 1.03* ... 84.

9510 *FolderBolt/The NightWatch Bundle* 139.

6134 *MacSafe II* ... 106.

GuardCard (SE or SE/30) (May '91) ea. 106.

★Kiwi Software ... 60 day MBG

6267 *KiwiEnvelopes! 3.1* ... 32.

7445 *KiwiFinder Extender 1.02* ... 63.

★Loop Software ... 30 day MBG

5442 *PictureBook 3.2A* ... 39.

★Magic Software ... 30 day MBG

7267 *AutoSave II 2.0* ... 26.

7270 *Backmatic 2.0* ... 50.

★Microcom ... 30 day MBG

8562 *⑦Complete Undelete 1.1* ... 48.

4803 *⑦Virex 3.1* ... 57.

8561 *911 Utilities 1.0* ... 89.

★Microseeds Pub. ... 60 day MBG

7068 *⑦INITPicker 2.01* ... 34.

2913 *⑦Redux 2.0 49. 7116 Rival 1.1.4* 49.

★Microsoft ... 30 day MBG

4471 *QuickBasic 1.0* ... 64.

Multi-Ad Services

8850 *Multi-Ad Search 1.0* ... 125.

★Nine to Five Software ... 30 day MBG

9767 *Reports 2.0* ... 94.

★Now Software ... 30 day MBG

6925 *Now Utilities 2.0* ... 75.

6739 *Prototyper 3.0* ... 184.

Olduvai

4503 *MultiClip 2.1* ... 69.

★ON Technology ... 1 year MBG

6385 *On Location 1.02* ... 75.

9801 *⑦Meeting Maker (5 user)* ... 289.

9800 *⑦Meeting Maker (10 user)* ... 549.

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8210 *⑦PLOTTERgeist 2.0 (June '91)* ... 199.

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7404 *⑦DiskDoubler 3.7 (June '91)* ... 44.

★Softstream ... 30 day MBG

5440 *HyperHit 3.0* ... 119.

★Solutions, Inc. ... 60 day MBG

3448 *SmartScrap & The Clipper 2.1* ... 56.

3449 *SuperGlue II 2.01* ... 75.

★SuperMac Tech. ... 60 day MBG

3377 *⑦DiskFit 2.0* ... 58.

★Symantec ... 30 day MBG

5176 *⑦Symantec AntiVirus for Mac (SAM)* 65.

5724 *Symantec Utilities for Mac (SUM II)* 96.

6748 *Norton Utilities for the Mac 1.01* ... 83.

3421 *⑦THINK Pascal or 3420 ⑦THINK C* 165.

★Synex ... 30 day MBG

6665 *MacPhonebook 3.0* ... 32.

7147 *MacEnvelope 5.02* ... 57.

6666 *MacEnvelope+ 2.0* ... 185.

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7872 *Software Bridge 1.0* ... 79.

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8058 *TScript 1.4* ... 91.

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8794 *Adobe Type On Call CD/ATM* ... 47.

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Dubl-Click

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- 1402 Alphabet Blocks 1.0 29.

Broderbund Software

- 4314 Typel 1.0 18.
7643 Katie's Farm or 7640 McGee ea. 24.
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8707 Liaison 3.0. 279.

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7058 SoftPC-AT/EGA Module 1.4. . . . 124.

4089 SoftPC 1.3. 245.

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8349 Maxfax. 289.

8709 2400M Plus. 219.

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6519 EtherGate. 1299.

8189 FastPath IV. 1889.

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3720 TOPS Flashcard. 155.

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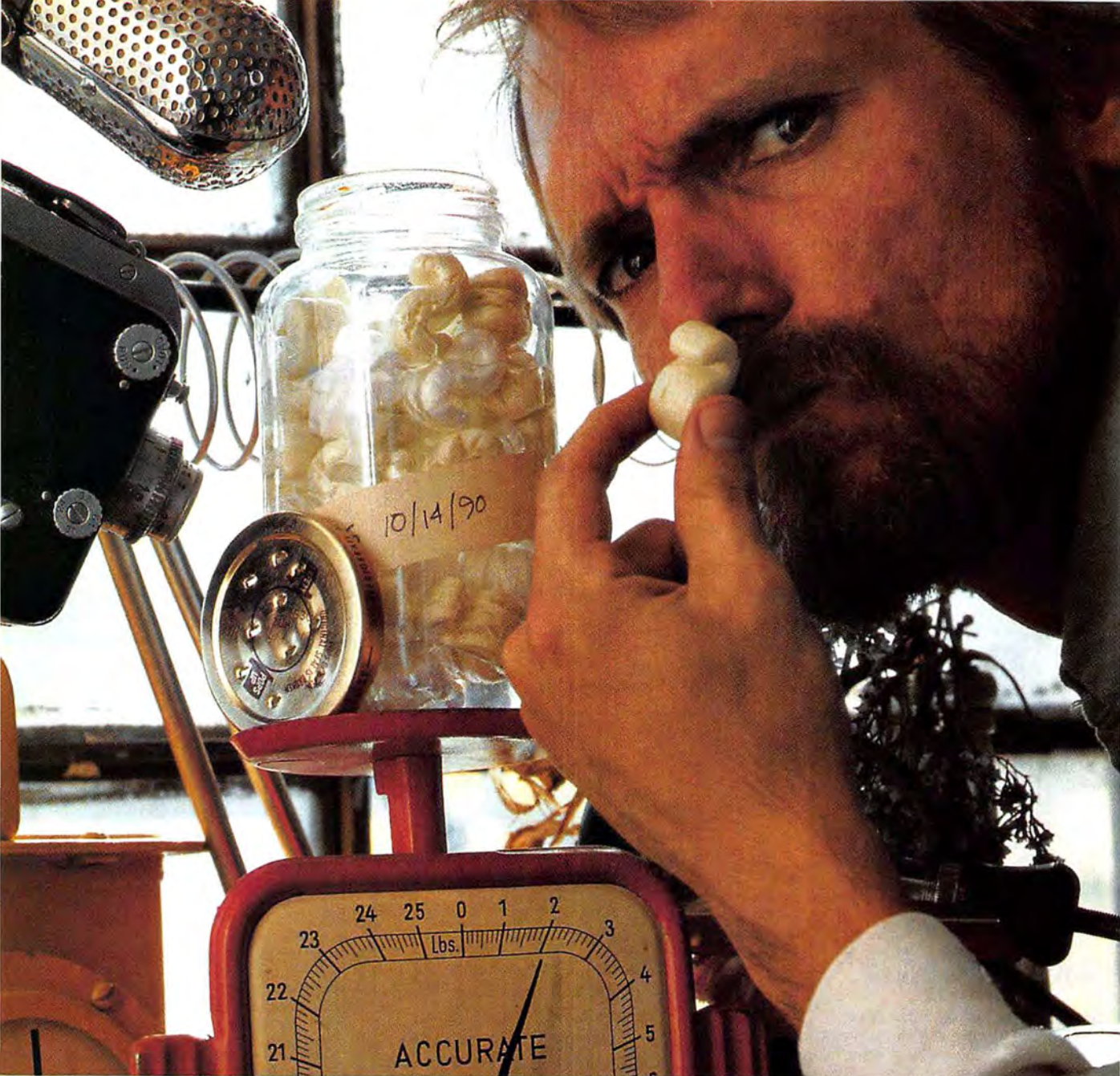
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8046	MVP Mouse	89.
	Ergotron	

9977	MacTilt (for Mac SE or SE/30)	68.
9978	MacTilt (for Mac Classic)	68.

★Goldstein & Blair ... 30 day MBG

8198	"What Do I Do Now?" Book	9.
8374	The Macintosh Bible (with disks)	25.
9283	The Macintosh Bible/"What" Bundle	30.

★I/O Design ... 30 day MBG

	Available in black (listed) or blue.	
8812	Ultimate Classic Carrying Case	64.
6129	Ultimate SE/Ext. Carrying Case	79.

★Kensington ... 30 day MBG

Full line available. Partial listing.

2580	Mac II Stand	\$20.
4973	Power Tree 20	22.
2578	Extra Long ADB Kybd. Cable (7 ft.)	24.
2573	Tilt/Swivel (platinum)	24.
2559	Apple Security Kit	33.
9303	Keyboard Shelf	39.
6763	SE Radiation/Anti-Glare Filter	52.
2566	System Saver Mac (platinum)	63.
5064	Apple Color Monitor Polarizing Filter	63.
9301	PassProof (right) or 9300 (left)	ea. 65.

★MacConnection ... 60 day MBG

4623	Solid Oak Disk Case (holds 90 disks)	32.
8795	Switch Box (2 Pos.)	32. 8796 (4 Pos.) 49.

★Mobius Technologies ... 60 day MBG

4470	Fanny Mac QT (Platinum)	53.
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★Moustrak ... 60 day MBG

2694	Moustrak Pad (7"x9")	8. 2692 (9"x11") 9.
2693	Moustrak Pad Low Friction (9" x 11")	10.

Ribbons

Available in black, blue, red, yellow, green, orange, brown, purple & silver.

3255	Image II Black	4. 9362 (12 Pak) 29.
3261	Image II Multi-4-Color	9. 9810 (6 Pak) 39.



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Ribbons—Low-cost (draft-quality) ImageWriter II ribbons available in black, blue, red, yellow, green, orange, brown, purple, & silver.

3255	ImageWriter II Ribbon Black	\$4. (Color) \$4.
3267	Black (6-Pack)	18. 9362 Black (12-Pack) 29.
3270	Rainbow Color (6-Pack)	18.

★Sopris Softworks ... 60 day MBG

	Ripstop Nylon Dust Covers	call.
4014	High Trek Mac SE & Ext. Kybd. Case	69.

★Targus ... 60 day MBG

3618	ImageWriter II Case	45.
3617	Mac Classic/Plus/SE Case	59.
4015	Mac SE & Ext. Kybd. Carry Case	75.

★Tripp Lite ... 30 day MBG

6199	Isobar 4 (surge suppressor, 4 outlets)	49.
6200	Isobar 6 (surge suppressor, 6 outlets)	59.

STORAGE MEDIA

★Sony ... 60 day MBG

3297	3 1/2" DS/DD Disks (10)	12.
6148	3 1/2" DS/DD Disks 3 Pak (30)	29.
3298	3 1/2" HD Disks 1.44 Meg (10)	19.
6375	3 1/2" HD Disks 3 Pak (30)	49.
8185	QD2040 Tape Cartridge	19.

★MacConnection ... 60 day MBG

6592	44 Meg Removable Cartridge	74.
9728	44 Meg Removable Cart. (10 Pak)	699.



Total Systems ... 30 day MBG

Gemini Classic—All the muscle of the award-winning Gemini II for the Mac Classic, plus 4 Mb SIMM support, special RAM disk capability—with beefed-up power supply for reliability. Includes Virtual from Connectix call.

★MAXELL ... 60 day MBG

2792	3 1/2" DS/DD Disks (10)	13.
2793	3 1/2" HD Disks 1.44 Meg (10)	21.

★3M ... 60 day MBG

3943	DC2000 40 Mb Data Cartridge	19.
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- 5895 UPS 110SE \$209.
6686 UPS 370ci 339.

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Applied Engineering

- 9799 Cache-In 199.

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- 9813 2 Pos. Laser (compatible switch box) 95.
9817 4 Pos. Laser (compatible switch box) 119.

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- 8124 Typist 479.
4476 OmniPage 2.12 495.

- OmniSpell 1.0 or OmniDraft 1.0 ea 69.

- 6661 OmniProof 1.0 105.

★CH Products ... 30 day MBG

- 7344 RollerMouse ADB 75.

Chinon

- 9834 DS-3000 Color Scanner 769.
8814 DS-3000 Scanner w/Dig. Darkroom 699.

- 8815 DS-3000 Scanner w/OmniPage .. 1069.



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3989 800K External Disk Drive—Low cost, reliable 800K external floppy drive. Reads both 400K and 800K disks; includes eject button and busy light. A great drive at a great price! \$119.

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- 1818 HyperDialer 32.
9830 MAC101E 129.

- 6815 Switchboard Function Key Modular 39.

- 6813 Switchboard Modular Trackball 98.

- 6901 Switchboard (modular keyboard) 159.

★Dove Computer ... 60 day MBG

- Marathon Racer 030 Plus or SE ea. 599.
9789 Marathon Racer 030 II 1079.

GDT Softworks

- 6256 PrintLink Collection 4.0 59.
7687 Mac Daisy Link 1.1.5 59.

- 6151 JetLink Express 2.1 89.

- 8960 ParaLink Express 99.

Hewlett-Packard

- 6514 HP DeskWriter Printer 759.
6586 HP DeskWriter Cartridge (Black) 19.

- 6754 HP LaserJet III (with toner) 1699.

Hitachi

- 9492 14" Color Monitor (includes 15-pin adaptor for Mac II) 599.

★Kensington ... 30 day MBG

- Turbo Mouse 3.0 (Plus or ADB) ea. 107.

Kodak

- 6730 DICONIX M150 Plus Printer 399.

★Kraft Systems ... 60 day MBG

- 7519 KM30 ADB Joystick 42.

★Logitech ... 30 day MBG

- 5082 ScanMan Model 32 G-Scale Scan. \$299.

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- 7841 16" 24-bit Color System for Mac II 4895.

- 19" Rival Sys. LC, SE, SE/30, II ea. 1199.

- 19" 8-bit System for SE/30 or II ea. 4295.

- 7840 19" 24-bit Color System for Mac II 6395.

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★MicroSpeed ... 30 day MBG

- 6620 MacTRAC (for 512, 512E & Plus) ... 59.

- 6621 MacTRAC ADB (for SE & II family) .. 69.

★Mouse Systems ... 30 day MBG

- 7560 Trackball ADB 68.

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- 9471 A3 Mouse 85.

★Nutmeg Systems ... 30 day MBG

- 15" Monitor: SE, SE/30, II or IISI ea. 599.

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- 19" Monitor: G-Scale SE/30, II, IISI ea. 1295.

- 20" Color System: SE/30, II, IISI ea. 2595.

★Orange Micro ... 30 day MBG

- 3036 Grappler 2.0 (9 pin) 92.

- 6229 Grappler LX 134.

Pacific Data Products

- 7412 Pacific Page PE 4.0 for the Mac .. 529.

★Sophisticated Circuits ... 30 day MBG

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Includes free instructional video tape.

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- 7497 1 Meg SIMMs for IIfx (set of 4) 239.

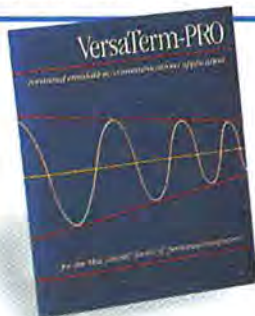
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- 8361 1.44 Meg High Density Drive 229.

- 8360 3.5 Mac 800K Drive 195.

- 8369 MacRam Portable 399.

MacRam Classic with 0, 1, or 3 Mb. call



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6619 VersaTerm-PRO 3.5—Communications program including Apple Communication Toolbox support & new protocol tools (TCP/IP, Telnet, FTP, LAT, ADSP, Serial Modem). Supports transfer for FTP, XModem, YModem, & Kermit protocols \$173.



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19" Rival Monochrome System for LC, SE, SE/30 or II—Sharp contrast and focus make the Rival the top choice of industry experts. Rock-solid performance and reliability give you high quality at a great price! ea. \$1199.

CD Technology

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- 3989 800K External Disk Drive . special 119.

- 5133 20+ Meg Hard Drive 329.

- 3990 30+ Meg Hard Drive 359.

- 3991 45+ Meg Hard Drive 379.

- 5275 60+ Meg Hard Drive 399.

- 5276 80+ Meg Hard Drive 469.

- 5456 45 Meg Removable Drive 599.

- 5736 45 Meg Removable Cartridge. 79.

★Dayna ... 60 day MBG

- 8723 DaynaFILE 360k Drive 369.

- 8722 DaynaFILE 1.2 5 1/4" Drive 369.

- 8724 DaynaFILE Dual 360k & 1.44 Mb. 739.

★DayStar Digital ... 30 day MBG

Listed items do not include coprocessor.

LT200 Connection (PC) 189. (MC) 299.

- 8556 FastCache for Mac IICI 279.

- 8586 40 MHz PowerCache IICI 949.

- 8585 50 MHz PowerCache IICI 1689.

- 8583 SCSI PowerCard (reqs. memory). 1095.

- 9955 SCSI PowerCard (4 Mb Installed). 1295.

25 MHz PowerCard 030 (II, IIfx, IICx) ea. 1095.

40 MHz PowerCard 030 (II, IIfx, IICx) ea. 1389.

50 MHz PowerCard 030 (II, IIfx, IICx) ea. 1895.

★Dove Computer ... 60 day MBG

MaraThon 030 Upgrades call

★Fifth Generation ... 30 day MBG

- 9403 JukeBox Five (auto disk feeder) ... 155.

- 9809 FastBack Tape 999.

Iomega

- 7551 44 Meg Transportable (reqs. kit) .. 929.

★Micron ... 30 day MBG

- 7149 Xceed IICI-128 Cache Card. 239.

- 6680 Xceed for SE/30 (640 x 480) 329.

Peripheral Land, Inc. (PLI)

- 8335 PLI TurboFloppy 1.4 309.

- 8334 PLI SuperFloppy 429.

- 8333 PLI Sony 40 Turbo Ext. Drive. 439.

- 8327 PLI Infinity 40 Turbo 739.

- 9752 PLI Infinity 88 Turbo 1339.

- 8330 PLI 105 Meg Ext. Drive 699.

- 8329 PLI 200 Meg Ext. Drive 1179.

- 9862 PLI 40 Meg Removable Twin. 1259.

Quantum

40 Meg & 105 Meg Internal Drives for Mac SE, SE/30, IIfx, IICI & IICx .. call

WORD PROCESSING

Taste

If you're looking for an affordable, capable word processor, DeltaPoint's new package may suit your taste.

Every once in a while, a new product delivers such exceptional value that it merits special mention. Taste is such a product. It's a word processor, drawing package, and database manager all rolled into a single package that's street-priced at less than \$100.

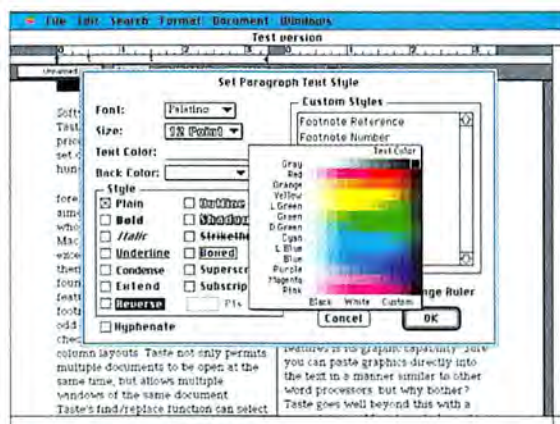
Beyond the Basics

Taste's primary focus is word processing. It's a midrange package that falls into roughly the same category as the more expensive MacWrite II and WriteNow, yet its talents exceed those of both competing packages. Taste provides auto-hyphenation, footnotes, stationery documents, column layouts, odd/even headers/footers, kerning, a spelling checker, and a thesaurus, all of which take it well beyond what you expect from a low-cost word processor. Taste also lets you open multiple documents or multiple windows within a single document simultaneously. A capable find-and-replace function operates on any attribute, including font, style, size, and color.

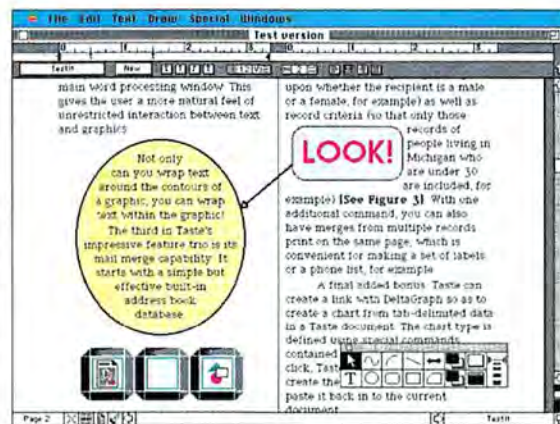
Although these are all impressive features for such a low-priced package, what's most distinctive about Taste is that its high-end features are so easy to use. This is most apparent in three specific areas: style sheets, graphics, and mail-merge.

Taste's style sheets combine much of Microsoft Word's functionality with MacWrite II's ease of use. There are options for both text styles and paragraph styles. You can define text styles based on combinations of font, size, style, and even color and then apply them to selected text. If you modify the style, your change will be applied to all previously entered text that uses that style.

Taste gives you lots of flexibility for formatting documents with style sheets. For defining paragraph styles, you can use all the ruler settings — including tabs,



For a low-cost word processor, Taste provides exceptional document-formatting control. The program's style-sheet functions approach the power of Microsoft Word's but are as easy to use as MacWrite II's.



Taste provides a drawing layer that lets you view your document as you create the graphics. The oval, the Look! box, and the arrow were all created with Taste's draw toolbox, located at the lower right. Taste also lets you wrap text within, as well as around, graphics.

justification, and line spacing — as well as all text-style settings. Once you've defined a paragraph style, you can specify whether it affects only paragraphs that you've selected or all existing paragraphs defined by the current ruler. This approach lets you modify an entire document in a single step, so you never have to resort to Select All or Copy Ruler commands.

The program imports and exports most popular word-processing formats, using Claris' XTND technology.

Tasteful Drawing

Taste does an outstanding job of handling graphics. The package provides an integrated object-oriented drawing layer, complete with Bezier curves and color gradient fills. What sets Taste's drawing layer apart, even from those of more expensive word processors such as FullWrite and WordPerfect 2.0, is the way it overlays the document layer transparently. The advantage of this approach is that you have the feeling of unrestricted interaction between text and graphics. Graphics created in the drawing layer are

automatically inserted in the underlying document layer, which is visible at all times. With FullWrite and WordPerfect, you must create and edit graphics in a separate window.

Taste's special graphics effects include text wrap around the contours of a graphic as well as *within* graphic borders. You can even attach graphics to paragraphs so they flow with the paragraph as you edit the document. And since text can be entered into graphics frames, you can combine the frames with columns to create complex page-layout designs.

The third of Taste's impressive features is its mail-merge capability. The program includes a basic but effective built-in address-book database. You can't add or delete fields or change their size (you can rename fields, however), and you can do only simple sorts. But for setting up mail-merges, it's far simpler and more flexible to work with Taste's address book than to work with tab-delimited files exported from a database application or created by a word processor.

It's extremely easy to manage the



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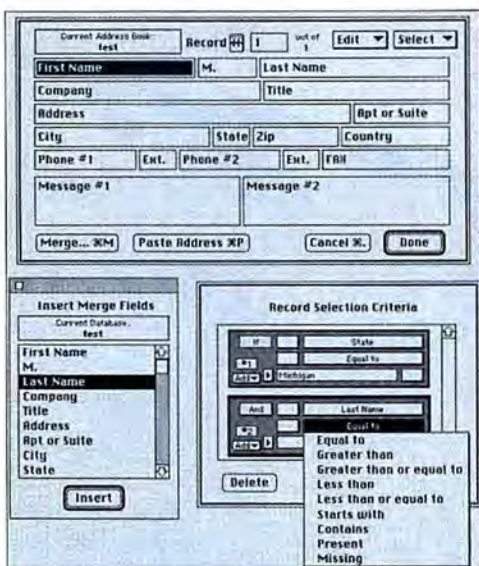
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*Contact QMS for availability of network options.

*Patent pending



Taste's address-book database makes it easy to do mail-merge. Although you can't add or delete fields and the program supports only basic sorts, Taste's selection powers are impressive. A HyperCard stack included with Taste converts address-book files created in other applications.

actual merge operations. You enter the merge fields, complete with delimiters, into documents with just a click of the mouse. This simplicity is combined with powerful selection functions. Selections can be based on field and record criteria. An additional option allows merges from multiple records to print on the same page, which provides a convenient method for making sets of labels or a phone list. Special stationery documents included with Taste make use of this label-making feature.

As a bonus, Taste links with DeltaPoint's graphing package, DeltaGraph, to create charts from tab-delimited data in Taste documents. DeltaGraph reads the data, creates the chart, and automatically pastes it into the current Taste document. Taste includes all the commands necessary to accomplish this task.

While the original version of Taste was plagued by agonizingly slow screen updates, particularly when graphics were involved, the performance of the new version is vastly improved. We found it quite adequate, even on a Macintosh SE. The program remains a bit sluggish for some operations, however, and its overall performance is still not on a par with that of MacWrite II.

Version 1.0 also suffered from bugs too numerous to mention. Many of them have been fixed with the new version, but enough remain to mar an otherwise outstanding program. One of the most annoying occurs when you're entering text within an existing paragraph. The word wrap sometimes works incorrectly, caus-

ing an apparent loss of text. You can usually correct this problem by scrolling to refresh the screen. Still, this problem and others like it can begin to erode your confidence in the reliability of an otherwise outstanding program.

The Bottom Line

Despite its breadth of features, Taste won't suit your needs if you require advanced word-processing functionality such as outlining, table-of-contents generation, indexing, or special table-making features.

Nevertheless, Taste is a superior mid-range word processor that delivers the bonus of a quite serviceable drawing program, a database manager, and page-layout tools. These functions, teamed with Taste's impressive style-definition features, make Taste a better value than the more expensive MacWrite II and WriteNow packages. And most important of all, Taste superbly balances sophisticated features with exceptional ease of use.

— Ted Landau

Get Info

Taste

Published by: DeltaPoint, Inc.,
2 Harris Court, Suite B1, Monterey,
CA 93940; (408) 648-4000.

Version: 1.01.

List Price: \$149.

CAD

Virtus WalkThrough

This year's MacUser Eddy award winner for breakthrough product of the year brings virtual reality to the Mac.

Virtus WalkThrough is a powerful modeling and visualization package that takes the concept of virtual reality from esoteric experiment to practical tool. Virtual reality makes it possible to explore worlds and interiors that exist only in the mind of their creators and, with Virtus WalkThrough, in the bits and bytes of Mac software.

Spatial Experience

Virtus WalkThrough lets architects and interior designers create conceptual designs of buildings and interiors and then move through and around them on-screen. It's an ideal tool for the pre-CAD, visualization phase of spatial design.

WalkThrough is the only program currently available that provides a completely interactive spatial presentation. Several modeling programs for the Mac let you animate fly-throughs, but you're restricted to a fixed path through the design. Only WalkThrough lets you move about freely, viewing the design from many different perspectives, in real time. And it doesn't limit you to wire frames. The program renders scenes, and it renders them with astounding speed, so you can move through a suite of rooms in seconds. It does all this with files no bigger than word-processing documents. By comparison, 8-bit PIC animation files of a two-bedroom house can easily grow to 150 megabytes. A similar WalkThrough file, on the other hand, is 15K, or one ten-thousandth the size of the animation file.

The program uses two types of viewing windows for navigating through models: a 2-D Design View, which is also used to create designs, and a 3-D Walk View, which creates the rendered perspectives as you move through the model. Although Walk View rendering is not



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recipient's tendency to act upon the information. So, in today's competitive business environment, the key question becomes, "Can we afford *not* to have the power of color?"

The ColorScript Model 30i Printer, Strictly For The Image Conscious

Extremely low cost Pantone-approved proofs in about 60 seconds. If you're a graphic designer, commercial artist or publisher it's easy to see how the Model 30i is revolutionizing your business. The QMS ColorScript 100 Model 30i is changing the relationship between speed, quality and cost by allowing you to do your job faster, cheaper *and* better!

The Model 30i is the first true "what-you-see-is-what-you-get" color printer. The colors you see on a Pantone-approved monitor are the same colors you'll see on a Model 30i proof *and* the same colors you'll see on the finished, printed piece. And the standard 11" x 17"/A3 paper handling capacity allows you to design actual size 8 1/2" x 11" full bleed proofs with crop marks.

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- Model 10 has standard 5 MB RAM expandable to 8 MB RAM
- Model 10 prints letter- and legal-size paper and transparencies
- Model 30i prints letter-size and 11" x 17" paper and transparencies
- AppleTalk®/RS-422, RS-232 serial and Centronics® parallel interfaces provide compatibility with most micro, mini, mainframe and workstation hosts
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with the QMS ColorScript 100 Model 10 and Model 30i, you get guaranteed compatibility and consistency. PostScript imitations, on the other hand, may not be 100 percent compatible with Adobe's PostScript.

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REVIEWS

photo-realistic, it does have advanced features such as translucent surfaces for glass or water; 24-bit color; and, as mentioned previously, impressive speed.

You maneuver through a model by using a mouse or a trackball. We found the trackball superior for navigation, but either method is simple and intuitive. If you're using a mouse, you hold down the mouse button and move the cursor up to move forward, down to go back, and right and left to rotate. The farther the cursor is from the center cross hairs, the faster you go. You can also move up and down or just look around in all directions without changing position. The focal-length tool adds a wide-angle or telephoto lens to your view.

Observations

As you move around in Walk View, a round object called the Observer also moves in Top View, one of the 2-D Design View perspectives. The Observer represents your position and the direction

you're facing in the model. If you want to view another room without moving through the model to get there, you can activate the Top View window, grab the Observer, and move it to your destination.

A third way to change your position is to rotate the Orientation Cube on the Tool palette. Each surface of the cube is labeled with a direction: front, back, left, right, top, and bottom. Like the Observer, the Orientation Cube moves as you navigate in Walk View. You can change your orientation in 3-D space by using the cursor to rotate the cube.

You can also record the path you take through a model by clicking on the record-path tool on the Tool palette before walking through your design. This is handy if you plan to use WalkThrough in a presentation.

Creating and editing models in Virtus WalkThrough is almost as quick and easy as moving around in them. Top View, the default 2-D Design View, is where you do most of your drawing. You can also open

windows for the Front, Back, Left, Right and Bottom Views. An object drawn in Design View immediately appears in Walk View as a rendered 3-D object.

Each time you create a room, you create a 3-D box by drawing rectangles in any of the 2-D Design Views (Front, Back, and so on) and use an extrusion marker on a ruler to set the room height. The interiors of boxes are rendered. Then you can place objects such as furniture inside the rooms. Boxes can overlap, and you can make unwanted walls invisible.

On the Surface

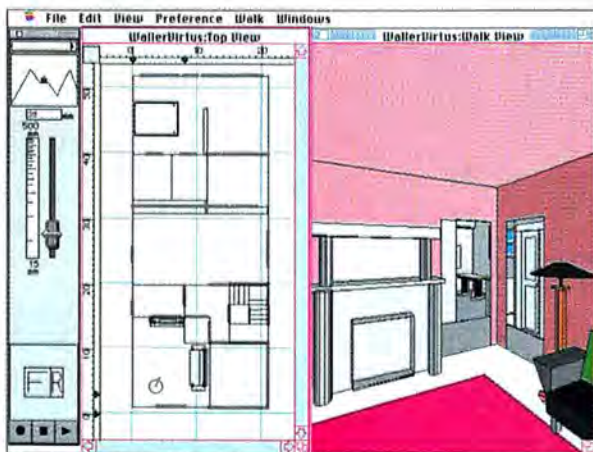
To create doors and windows, you cut holes in the walls, using the surface tool, which we found to be one of the most versatile and useful tools we've encountered in 3-D modeling. It ingeniously isolates wall surfaces from the rest of the floor plan. To use the tool, you click on a wall in the Top View and a separate window opens to display the elevation of your wall. You can then draw shapes on the wall using one of WalkThrough's opacity modifiers. If you choose the transparent modifier, the rectangles you draw will be doors. Translucent gives you windows and screens, and solid gives you rugs, molding trim, and colored walls.

Virtus WalkThrough has all the basic tools for creating the 2-D and 3-D shapes you expect to find in a modeling package. It also includes a unique tool for inserting or deleting the handles needed to stretch existing shapes. This tool comes in handy for tasks such as adding a bay window to a square room.

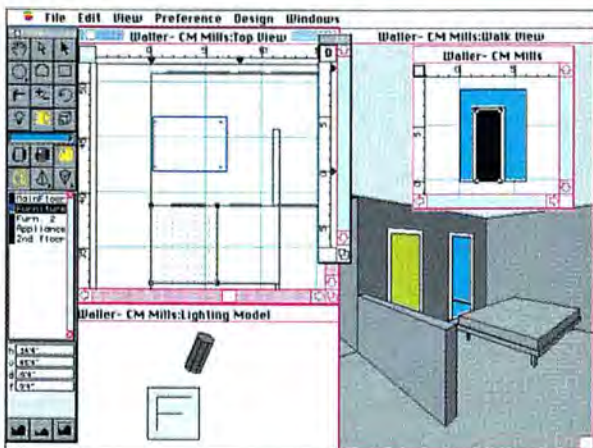
WalkThrough implements layers usefully by listing them on the Tool palette. You can rearrange the list by clicking and dragging the names. When you click and hold on a layer name, a pop-up menu gives you choices of how to display and color a layer. For example, you can display objects in inactive layers with dotted lines.

Virtus WalkThrough comes with small libraries of 3-D furniture, and you can create your own objects and add them to the libraries. You can walk around a 3-D library object and view it from any angle, just as you do in Walk View.

WalkThrough's Lighting Editor lets you set the color, intensity, and direction of interior lighting. Each object (or room) has its own lighting model. The default allows three sources of light for each room, but you can add more. Light sources can be ambient or directional, and you can change lighting direction with a simple



Virtus WalkThrough lets architects and designers create conceptual designs and then move around and through them. To navigate through a design with Virtus WalkThrough, you use the mouse in the Walk View (right) much as you would use a joystick.



The Top View is the base window for designing and editing models. Here, we've selected a particular wall that can be colored and outfitted with doors or windows. Lighting can be changed by clicking and dragging a light source in the Lighting Model.

O

ur Latest PostScript Printer Technology Impressed The Experts...



MacUser,
Editor's Choice Award
(Eddy), Jan. 9, 1991



PC/Computing,
Most Valuable
Product,
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BYTE,
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variety of diamonds and quadrangles. You can create custom icons with MacFlow's symbol editor, which lets you paste any paint or PICT image into a diagram. You can further customize your symbols from within MacFlow by resizing them and setting the default size and the number of connections per side.

MacFlow includes a full complement of tools for making complex charts attractive and easy to understand. In addition to color support, it provides a Bezier tool for creating curved lines, shadow differentiation for objects that include underlying notes, and varied line widths and arrowhead selections. Reduced and enlarged views, grid/snap commands, and alignment tools make document preparation easy.

To add more information to the flowchart, you can attach comments to any symbol. Each comment can contain up to a page of text. MacFlow headings, a standard chart element, work like any document heading, denoting the filename, date, and time on every page of a document. MacFlow also lets you extract segments of flowcharts to create chart libraries.

The Bottom Line

MacFlow, once a single-task tool, steps beyond programmer productivity into the realm of business communication with version 3.5. Unlike previous versions, which limited you to programming symbols, version 3.5 lets you create and edit a host of multipurpose symbols for your charts, using graphics imported from other programs. Additional tools, such as Bezier curves and varied line widths and arrowhead selections, help you optimize the effectiveness of your charts for communicating plans and ideas. If you need to brainstorm a marketing strategy, document a procedure, draw a decision tree, or define a program's logic, MacFlow 3.5 is an excellent companion.

— Daniel W. Rasmus

Get Info

MacFlow

Published by: Mainstay, 5311-B Derry Avenue, Agoura Hills, CA 91301; (818) 991-6540.

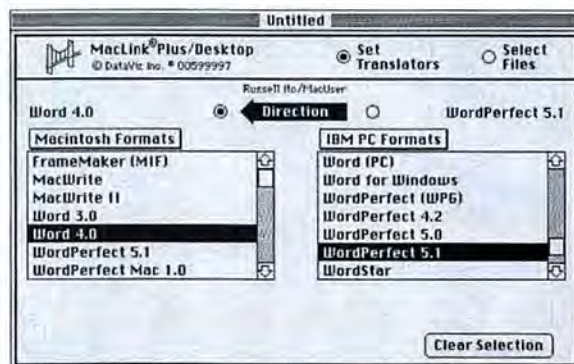
Version: 3.5.

List Price: \$295.

UTILITIES

MacLinkPlus/Translators

The latest translation package from DataViz provides a complete solution for transferring files between Macs and PCs.



DataViz's MacLinkPlus/Translators package provides a wide variety of Mac and PC file-format translators.

In the flood of file-translation software unleashed by AFE (Apple File Exchange) and the Mac SuperDrive, the new version of DataViz's MacLinkPlus/Translators stands out as the most complete and easy-to-use solution for exchanging a wide variety of file formats between Macs and PCs.

Translation, Please?

The new version of MacLinkPlus/Translators adds 50 new file translators, including some for graphics and Windows 3.0 formats, to its already impressive collection. In addition, the new package includes Dayna Communications' DOS Mounter software, which makes DOS floppy disks loaded in the Mac SuperDrive visible from the Mac desktop and from within Mac applications.

The versatile MacLinkPlus/Translators supports several methods of exchanging files between Macs and PCs. The package comprises three elements: the MacLinkPlus translators, the MacLinkPlus/Desktop utility, and DOS Mounter. The translators work with AFE or Claris' XTND technology, both of which execute the actual conversion process between PC and Mac formats.

You can use the MacLinkPlus/Desktop utility (the original MacLinkPlus software) to handle the conversion process, as an alternative to using AFE or the Claris solution.

DOS Mounter 2.0 is an INIT that lets Mac users with Mac SuperDrives mount DOS-

formatted 3.5-inch floppy disks on the Mac desktop.

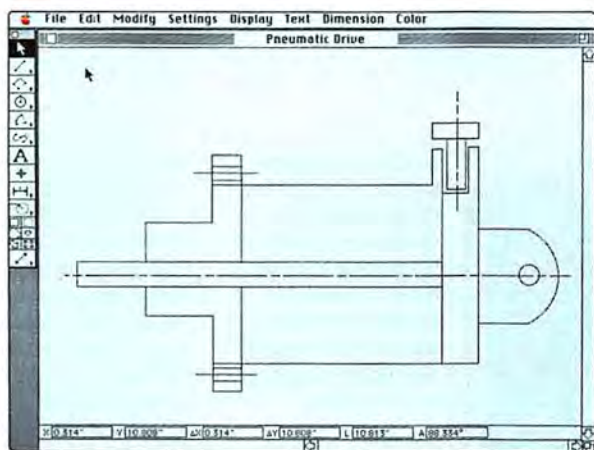
To use the MacLinkPlus translators with AFE, you drag the MacLinkPlus translator file to the AFE folder. From that point on, the AFE utility finds and uses the appropriate MacLinkPlus translators automatically. This means that all you have to do is launch AFE, pop a DOS-formatted floppy into your drive, and begin translating and transferring files. The only drawbacks are that AFE loads very slowly when the MacLinkPlus translator file is in its folder and that AFE forces you to access the list of translators through a sluggish, seemingly interminable pull-down menu. Creating customized settings for only the specific translators you want to use is a workaround to this problem, but that process can be slow and clumsy.

The MacLinkPlus/Desktop utility, on the other hand, is fast about its conversion business. What's more, you can select the translators or build custom settings via a speedy scrollable list. Unlike AFE, however, the DataViz utility can't mount DOS floppies on the Mac desktop. You must first transfer the files to your Mac via modem or AFE. Or if you have a Mac equipped with a Mac SuperDrive, you can take advantage of the package's DOS Mounter 2.0.

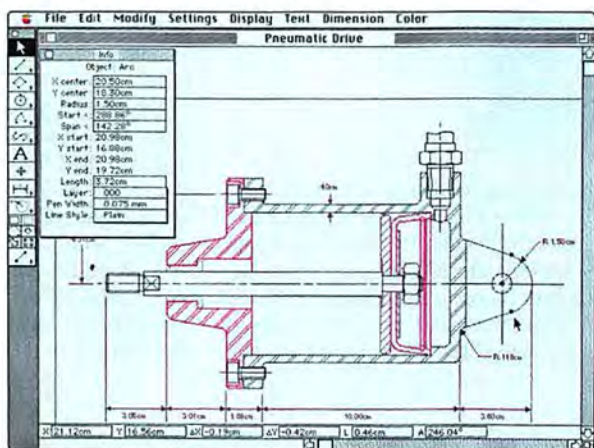
DOS Mounter

Most users who have a SuperDrive will find that using MacLinkPlus/Desktop combined with the DOS Mounter is the

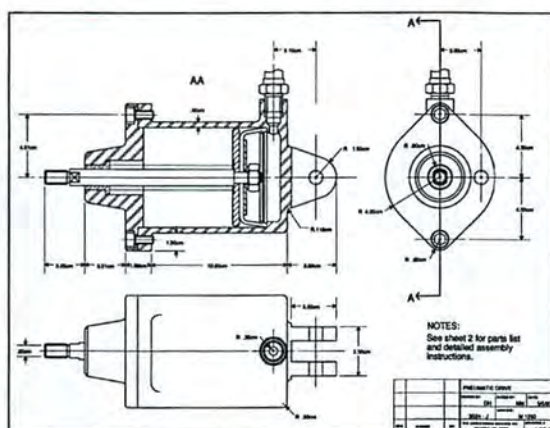
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easiest way to transfer and translate PC files. With the DOS Mounter installed, you open the MacLinkPlus/Desktop software, choose the appropriate file translators (unfortunately, MacLinkPlus/Desktop isn't smart enough to select them for you), and slip a DOS-formatted floppy

into your SuperDrive. You then select the files on that floppy that you want translated (only files that can be translated with the selected translator appear in the selection list), choose a destination for the file on your Mac, and click the Convert button. A log file tracks any problems that

The DataViz package successfully translates PC file formats from character-based and graphical applications. Here, the product enabled a Windows BMP file to be brought into Adobe Photoshop as a PICT image.

might arise during the conversion.

Keep in mind that DOS Mounter works so well that if you try to use AFE while the DOS Mounter INIT is active, AFE will think the inserted DOS floppy disk is a Mac floppy disk and will display only the Mac-to-Mac translation menu. You can work around this by holding down the Option key as you insert the DOS disk, which temporarily disables DOS Mounter.

If you need to import PC files primarily into Claris' MacWrite II, you can use the supplied bridge software in the MacLinkPlus/Translators package. It allows MacWrite II to import DOS files via Claris' XTND technology.

Whatever approach you finally adopt with MacLinkPlus/Translators, you'll generally find the results to your liking. We successfully worked with a variety of DOS word-processing documents, including Word for Windows, Word 5.5, WordPerfect 5.0 and 5.1, and WordStar. We translated them into Word 4.0, MacWrite II, MacWrite, and WriteNow file formats.

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**HEWLETT
PACKARD**

The March '91 review (page 68) compared the accuracy of MacLinkPlus' conversions of WordPerfect 5.0/5.1 (PC) documents to Word 4.0 (Mac) unfavorably with the accuracy of other conversion packages, but MacLinkPlus/Translators offers a vast improvement in this area. Its new WordPerfect 5.1-to-Word 4.0 translators, in particular, offer far-more-accurate translations than its previous version. Footnotes, headers, footers, and point sizes are all more faithfully rendered.

Overall, the success of MacLinkPlus/Translators' document-formatting translation depends on the original DOS application. In general, we found that the package successfully translated indents, boldface, headers, footers, and even footnotes from other character-based DOS word processors as well as it did from WordPerfect. It also correctly translated more-advanced formatting elements (fonts, point sizes, and tables) supported by word processors with graphical user interfaces, such as Word for Windows. The single document-formatting element

that DataViz software still couldn't cope with was multiple columns.

In addition to support for word-processing files, MacLinkPlus/Translators provides substantial support for graphics-, database-, and spreadsheet-file formats on the Mac and PC. Lotus 1-2-3 worksheets translated to Excel 2.2 Mac format without incident and with functional Excel formulas in place. The DataViz filters also make translating PC graphics-file formats (specifically Paintbrush PCX, TIFF, and Windows BMP) to Mac PICT files a snap.

The Bottom Line

If your file-translation needs are limited to word-processing documents, specific word-processing-file translators, such as Word for Word or Software Bridge, are probably a better choice than DataViz's package. The DataViz translators have been improved since the last version, but they still don't handle newspaper or snaking columns well.

Overall, however, the MacLinkPlus/

Translators package overwhelms the competition with the sheer number of translator pairs it provides (more than 350) and the wide variety of file types it translates (spreadsheet, database, graphics, and word processing). What's more, with DOS Mounter 2.0 bundled with the new version, the DataViz package becomes an excellent overall solution for moving files between PCs and Macintoshes equipped with Mac SuperDrives.

— Gregory Wasson

Get Info

MacLinkPlus/ Translators

\$\$\$½

Published by: DataViz, Inc.,
35 Corporate Drive, Trumbull,
CT 06611; (203) 268-0030.

Version: 5.0.

List Price: \$169.

got it made in the shades.



DATA ACQUISITION AND ANALYSIS

Ultimage and IPLab Spectrum

Two image processors reveal hidden scientific data in photographs.

Ultimage and IPLab Spectrum are image-processing packages that take different approaches to extracting scientific data from photographs. Ultimage is the more fully functional of the two, but at less than \$1,000, IPLab Spectrum is a good value if you don't need morphology and quantitative analysis.

Pixel Data

If you've ever wished you could alter a blurry, dark photograph so you could identify that woman standing next to Uncle George, you've wished for the capabilities of scientific image-processing software. Team Ultimage or IPLab Spectrum with a Mac, and not only can

you identify Uncle George's friend but you can also get her shoe size.

Of course, scientists are less interested in shoe sizes than in data gleaned from satellite, X-ray, or microscope photographs. Although Ultimage and IPLab Spectrum have their strong points when it comes to revealing the data hidden within a digitized photo's pixels, neither measures up to the power, sophistication, and extensibility of a third image-processing package, Automatrix's Image Analyst (see review, July '90, page 55), which was nominated last year for a *MacUser* Eddy award.

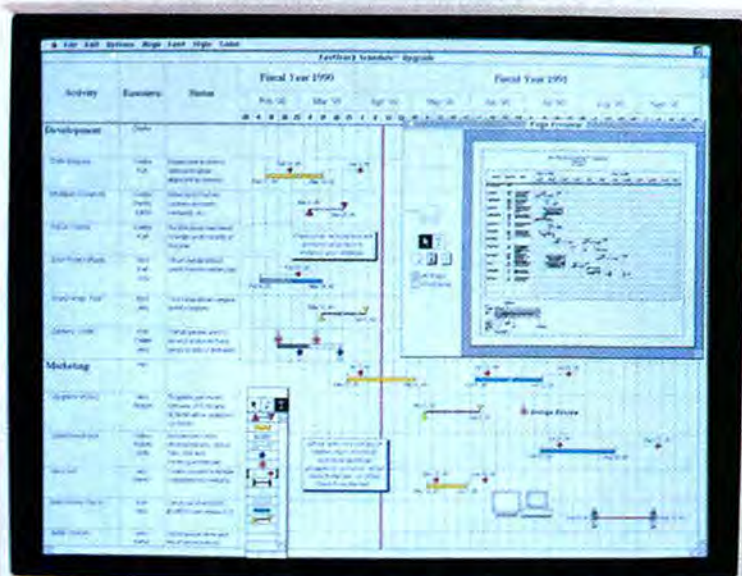
Ultimage and IPLab handle photographic-quality color images, support

video capture, and come with scripting languages. The two differ in the level of functionality they provide in the three basic image-processing areas: *strict image processing/analysis*, which alters pixel intensities to reveal hidden information; *morphology*, which alters the shapes of objects; and *quantitative analysis*, which is the measurement of objects in an image. Ultimage provides functions in all three areas, whereas IPLab lacks the latter two. Ultimage also builds most functions directly in to the program, whereas IPLab Spectrum relies heavily on scripting.

Ultimage

The Ultimage package comes in two versions: the \$2,990 Ultimage/X (the subject of this review) and the \$2,090 Ultimage/S, which doesn't provide the X version's automatic particle detection feature and Analyze menu. Although Ultimage/X is not as intuitive or elegant as Automatrix's Image Analyst, its interface is superior to that of IPLab Spectrum, because it follows standard Mac-interface

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*Centronics® parallel interfaces not available for the original LaserWriter and LaserWriter Plus printers.

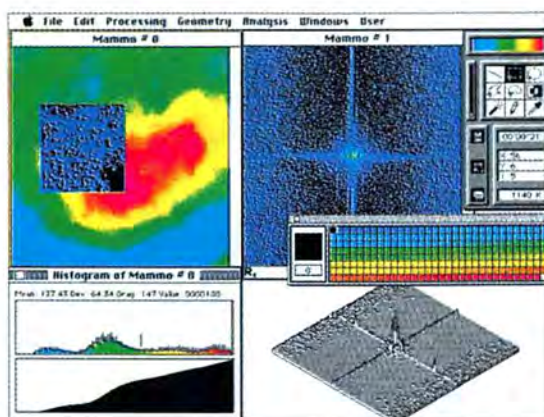


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Ultimage is a powerful scientific image processor that lets you extract data, such as the location and size of objects or particles, from satellite or microscope photographs.

which graphs gray values by using input versus output, as you can with IPLab.

Ultimage provides 28 arithmetic and logical operations that are useful for masking and averaging sections of images, removing noise, and making comparisons. It also has 13 spatial filters, which alter pixels according to local intensity. These include high-pass filters for contrast and outlines.

There are also several frequency-processing filters (high- and low-pass) based on the powerful FFT (Fast Fourier Transform). The FFT result is displayed in a window, which switches among the real, imaginary, magnitude, and phase components of the FFT image.

Ultimage's morphological transformations, which are useful for sharpening and defining objects or removing artifacts such as an isthmus, include thresholding, eroding, and dilating and advanced transformations such as hole filling.

The program's quantitative analysis consists of 42 measurements, including area, perimeter, center of mass, and object




guidelines more closely. As a result, most tasks in Ultimage require fewer steps than do tasks in IPLab. Ultimage also lets you access its most useful tools directly from its Tool palette, whereas IPLab Spectrum hides some tools in a submenu.

Ultimage's 3-D View command plots a perspective graph based on light intensity, so bright areas show up as mountains and dark areas as valleys. A 2-D function

does the same thing along a line you draw, making it a handy tool for defining boundaries. Ultimage's versatile histogram can have either a linear or a logarithmic vertical scale.

Ultimage's image-processing functions include eight predefined lookup-table transformations, which alter pixel values with respect to overall intensity. Unfortunately, you can't display a gamma chart,

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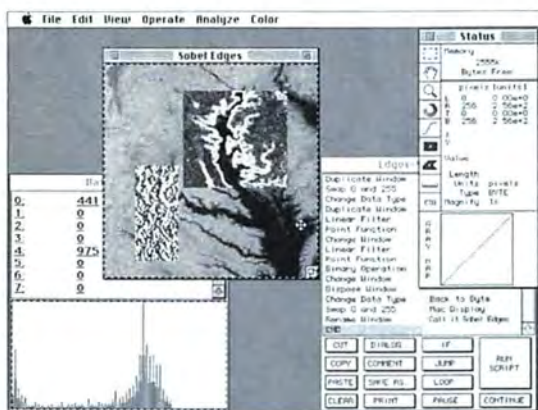
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count. You can even measure the angle formed by two lines or three points. It can calibrate measurements in units from an angstrom to a nautical mile.

Bundled with Ultimage are the Auto-Mac III macro program and the Developer's Toolkit. The latter includes instructions and libraries for writing your own functions in C, Pascal, and FORTRAN. These external routines become

extension modules that show up in Ultimage's User menu.

For high-end expansion into data acquisition, you can get Graftek's Concept VI libraries (which include Ultimage/X) for use with the Eddy-award-winning LabVIEW 2 (see review, May '91, page 58). Concept VI comprises LabVIEW 2 files designed for image-processing and control functions such as those used by

IPlab Spectrum processed this satellite photo of Washington, D.C., with a Sobel function, used to extract contours. The program processes 24-bit-color images in addition to gray-scale ones, but it's particularly complex and unwieldy to use with color, because of its lack of automated processes.

robotic vision systems. The functionality of the combined solution of Concept VI and LabVIEW 2 rivals that of the team of Image Analyst and MacRAIL from Automatrix, and the Concept VI solution is less expensive and easier to program. The cost of the Concept VI family ranges from \$1,200 to \$3,200 (not including LabVIEW).

IPlab Spectrum

For a fraction of Ultimage's cost, IPlab Spectrum delivers many of the same image-processing functions but without morphology and quantitative analysis. Signal Analytics has two versions of IPlab Spectrum: the \$749 color version we reviewed and a \$499 gray-scale version.

IPlab Spectrum's chief strength is its scripting language. As with Apple's MacroMaker, you record commands by executing them. IPlab's major drawback, however, is that it forces you to do too many basic operations manually. Because of this design, many tasks that should involve a single menu command and one

Are you

dialog box require half a dozen steps. IPLab offers a way around these inconveniences by letting you create scripts to automate certain tasks.

IPLab's interface is neither predictable nor intuitive. For example, most Macintosh applications automatically display the Tool palette. IPLab requires you to access its Tool palette from a menu. Furthermore, selecting a tool from the IPLab's Tool palette doesn't change the icon to show you that it's activated. These are small details, but they extend throughout the program and become cumulatively annoying.

On the other hand, some IPLab features are true gems. In addition to some of the basic image-processing functions such as filters and FFTs found in Ultimage, IPLab has a powerful Point Function command. There are 16 mathematical expressions that alter single pixels, based only on the original value, and 3 user-configurable parameters. Another plus is IPLab's Movie command, which rapidly cycles through all open windows, sequentially displaying

the various processing steps.

You can store pixels as one of four data types: 1 byte (256 gray levels, as in Ultimage), 2 bytes (16-bit), 4 bytes (32-bit), and 4 floating-point bytes.

The Bottom Line

For those who are about to enter the fascinating world of scientific image processing, we recommend a shareware program from the National Institutes of Health called Image. It's available from *MacUser's* Zmac as well as other on-line services. It doesn't have the power of the packages reviewed here, but it will give you a feeling for image processing.

When it comes to choosing a package, we recommend IPLab Spectrum if you don't require morphology and measurement. At \$749, it packs a lot of functionality for the price, despite its flawed interface.

Ultimage is better compared to Automatrix's Image Analyst. Ultimage's interface is not as elegantly implemented as that of Image Analyst, and it costs \$1,000 more. However, for machine-

vision projects, Graftek's Concept VI libraries for LabVIEW 2 (which includes Ultimage) are worth considering.

— John Rizzo

Get Info

IPLab Spectrum

Published by: Signal Analytics Corp., 374 Maple Avenue E., Suite 200, Vienna, VA 22180; (703) 281-3277.
Version: 1.0.
List Price: \$749.

Ultimage/X

Published by: Graftek-France GTFs, Inc., 2455 Bennett Valley Road, #100C, Santa Rosa, CA 94404; (707) 579-1733.
Version: 1.4.1.
List Price: \$2,990.

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QUICK CLICKS



Are you looking for a way to create fast, colorful animations in your HyperCard stacks? Until now, you had to rely on button tricks and XCMD workarounds. No more. ADDmotion, a new product from Motion Works, is an extension to the HyperCard development environment that provides a powerful set of animation tools.

ADDmotion, which requires HyperCard 2.0, is a stack that functions as an adjunct to your Home stack. It provides two new menu options, New Animation and Open Animation, that are appended to the standard HyperCard File menu. Once you've chosen either of these options, you enter ADDmotion's world of color graphics and animation.

Now comes the hard part. Animation is a lot of work no matter how good the software is — ask all those who have pulled their hair out trying to learn MacroMind Director. ADDmotion attempts to leapfrog many of the complexities of other animation software, but you still have to read and reread the manual.

ADDmotion comes with a full bag of tricks: props (stationary objects), actors (moving objects), cels (instances of a moving object), paths (sequences of locations), TimeLines (an editing window), and a Media Controller (a palette that looks and works like a VCR). It also has a basic color painting program you must master and a set of sound tools that's compatible with the IIsi and LC sound-input plug and microphone as well as with Farallon's MacRecorder.

You can plot your animations manually on-screen and then smooth and scale them numerically, using dialog boxes. When you have all that under your hat, you can start learning cues. Cues are the messaging system that allows your animations to be controlled from HyperTalk.

ADDmotion's performance and color will impress anyone who has watched HyperCard flip through cards or drag button icons. Moreover, you'll find that ADDmotion distinguishes itself from the field of often-shabby HyperCard add-ons. It's a sharp, professional product.

And there are more animation goodies on the way. Motion Works has announced future upgrades that'll provide complete

access to ADDmotion tools from HyperTalk. (Actually, if Claris was smart, it would license this little company and build ADDmotion into HyperCard.)

ADDmotion isn't a product for the browsing novice or the faint of heart, but it's a far simpler and less expensive solution than stand-alone animation products. Here's another important consideration: ADDmotion offers run-time XCMDs that allow you to distribute your animations royalty-free.

Motion Works, Inc., 1334 W. Sixth Avenue, Suite 300, Vancouver, British Columbia V6H 1A6, Canada; (604) 732-0289. Version 1.0. \$295.

— Scott Kronick



SampleCell is a sample-playing Mac II board that significantly cuts the cost of high-quality sampling by harnessing the Mac's power. Although the SampleCell package provides excellent software tools for editing and modifying the prerecorded samples it includes on a CD-ROM, it doesn't supply any recording facilities for users who want to create their own custom samples.

SampleCell offers a less expensive alternative to a sampling instrument by relying on the Mac to do the sound processing. SampleCell hardware comprises a SIMMless NuBus card socketed for 8 megabytes of RAM, which can store about 100 seconds of sound at the standard sampling rate of 44.1 kilohertz. Digidesign, SampleCell's maker, also supplies a "stuffed" board with the 8 megabytes of RAM already loaded, for \$1,000 more. However, the card uses standard 1-megabyte SIMMs, so you can add the SIMMS to the board yourself for about half the price. Because it is a NuBus card, SampleCell hardware requires a Macintosh II-class machine (IIsi owners need a NuBus adapter).

The package provides the following software: the SampleCell Editor for loading samples onto the card; the Sound Designer SC, a special version of Digidesign's well-respected sample-editing program; and a CD-ROM, stuffed with 630 megabytes of superbly sampled instruments and sound effects.

The SampleCell system can play 8 stereo or 16 mono instrument sounds or 32 sound effects at a time. You can play

sounds from a MIDI keyboard connected to the Mac or trigger them from a sequencer or other MIDI program running under MIDI Manager, Apple's system software for musical multitasking.

SampleCell responds on all 16 MIDI channels, with different sounds on each channel and with each sound sent to any of four pairs of stereo audio outputs. You can use as many SampleCell cards as you have slots, meaning that with a full-sized Mac II or a compatible expansion chassis, you can put together a monster sampling system that is far more complex than anything else on the market.

Editing and organizing the huge amount of data in samples is a tough job when you use the little LCD screen most sampler instruments give you. But the same task with the Mac's display is a breeze. The main screen of the Editor program looks like a mixing console, with faders and buttons for each sound. SampleCell provides a wide variety of functions for manipulating the samples in real time over MIDI, and setting them up is an easy and intuitive process.

Unlike a sampler instrument, SampleCell has no facilities for recording samples. But the CD-ROM that comes with the package can keep you busy for a long time. For custom sounds, you need a hard-disk recording system such as Sound Tools or Audiomedia, both from Digidesign. SampleCell is completely file-compatible with both. Sound Designer SC lets those who already have an external sampler download sounds from it onto the SampleCell card.

SampleCell hardware is based on technology developed by Dynacord, a European maker of high-end samplers that are no longer available in this country. As a result, SampleCell sounds as good as the most expensive samplers made by American and Japanese manufacturers.

In practice, SampleCell kills several birds with one stone. Compared with sampling instruments, it's inexpensive — assuming that you already own a Mac II-class machine. It's also highly flexible and expandable in ways sampling instruments can only dream about. Most importantly, SampleCell encourages the use of high-quality sound in applications and presentations in which external hardware just isn't practical.

Digidesign, 1360 Willow Road, #101, Menlo Park, CA 94025; (415) 688-0600. Version 1.1. \$1,995.

— Paul D. Lehrman

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SimEarth



In the beginning there was SimCity, and it was good. But creator Will Wright refused to rest. "Bigger and better," he mused. SimCounty? SimCongressional-District? SimTimeZone? Small thinking. SimUniverse? Too big to fit on a disk. SimEarth? Perfect!

SimEarth is Will Wright's follow-up to his award-winning SimCity, from Maxis. In SimEarth, you are the Supreme Being who engineers the birth of an Earth-like planet, complete with atmosphere and oceans. You guide your planet from evolution to civilization and finally on to the point of Exodus, where intelligent life becomes advanced enough to spread its seed throughout the universe. SimEarth gives you ten billion years to accomplish this task before your sun becomes a red giant and gives all life a terminal tan.

Once you've formed your world, you have the power to change many of the

planet's ecosystems. You can control monumental forces such as continental drift, solar input, and population reproduction and mutation rates. As the planet's Supreme Being, you can also trigger natural disasters such as earthquakes.

Once life on your planet has begun with the humble prokaryote (a single-cell microbe), you can choose from 14 different life forms — ranging from microscopic cooties to mammals — to inhabit your planet. If you judiciously control these elements, it's possible, and even likely, that man will not emerge as the dominant species. In fact, your orb may be ruled by amphibians or cockroaches.

More than a mere game, SimEarth risks being classified as educational. Because it's based on James Lovelock's Gaia hypothesis, SimEarth views the earth's varied systems as a self-regulating whole. For example, if you throw enough carbon dioxide into the atmosphere by burning fossil fuels, you're likely to see a change in air temperature and quality that will adversely affect your life forms.

The creators of SimEarth have provided enough gimmicks and graphics to transform what could be a dry enterprise into something fascinating and entertaining. Do you secretly fear insects? Fine — wield the extinction tool, and wipe 'em out! Tired of the confines of Earth? Fire up the Mars or Venus scenario, and inhabit hostile worlds. Even Michael Bremer's manual is brilliant. A lot of heart and effort went into SimEarth, and it shows.

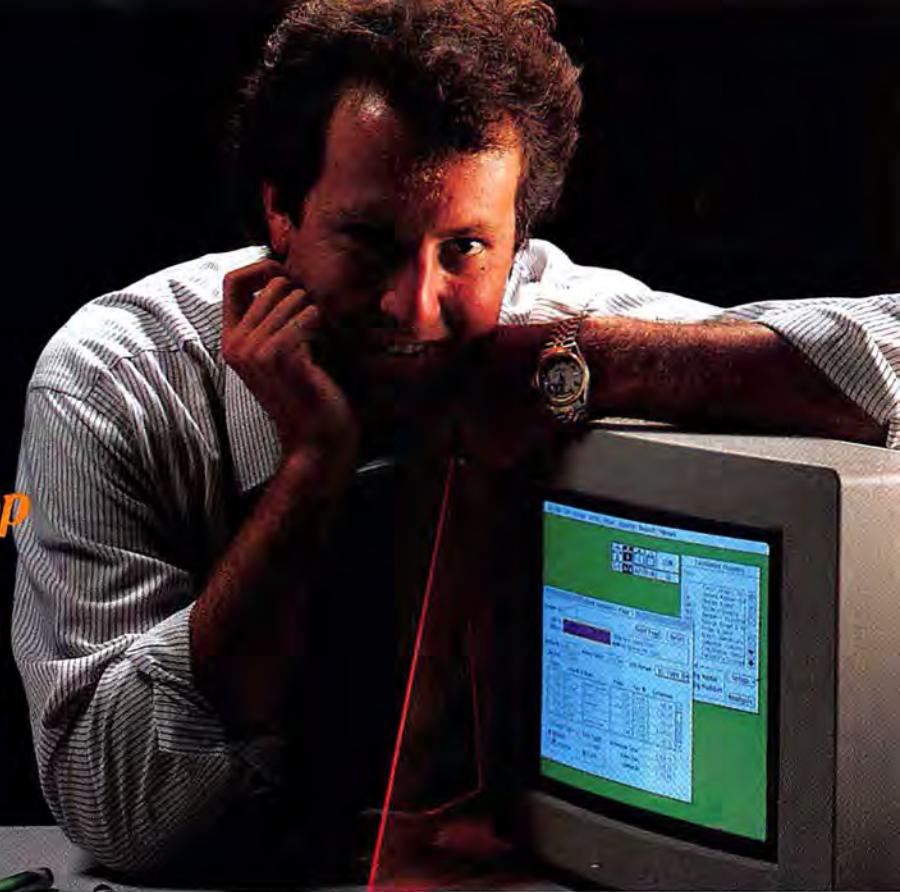
However, there are some caveats. Bugs in version 1.0 make the game a bit frustrating at times. Some tools, for example, may suddenly stop working or give erroneous information. Maxis is working on a bug fix that should be available by the time you read this. And be forewarned: SimEarth requires several hours of learning time. The flipside of its brilliance is a complexity that's a bit daunting at first. But take the plunge. It's well worth it.

Maxis, Two Theater Square, Suite 230, Orinda, CA 94563; (415) 254-9700. Version 1.0. \$69.95.

— Christopher Breen

Imagine Losing Everything In Your Mac.

I'm good at desktop publishing. But desktop accounting scared me. The thought of doing bookkeeping for my design studio got me uptight.



When I heard "balance sheet," I broke into a sweat. I know type, advertising, printing. Now I was forced to do our books.

No choice.

We were on our third part-time bookkeeper in eleven months, and she was called away suddenly. Sound familiar?

But I'm the boss and the buck stops with me. We had bills to pay, payroll checks to write, invoices to send, taxes to set aside.

And deadbeats to collect from—only I had no idea who owed us how much or for how long. Some suppliers may have even

thought of us as deadbeats. I needed to know our cash flow, and get a handle on all this. But I didn't have a lot of time.

Step one: find an accounting program that feels as familiar as our Macs, that starts out easy, but has lots of reserve firepower for later on.

I found atOnce! The manual looked orderly. I dug in...

The familiar with the unfamiliar
atOnce! starts you off with a tutorial that uses HyperCard, one of my old favorites. I was at home.

Numbers are my nemesis, but the tutorial was actually fun and got me comfortable. It takes you step by step through the program, and gives you some easy-to-swallow accounting basics so you're not reading a foreign language. There's context-sensitive help, just in case.

And while you learn, you can start to set up your books. So it doesn't come in a flash and you sweat a little. But you do it and you learn.

I started off light. Double-clicked on one of the default charts of accounts and my General Ledger was practically set up for me. Then entered a few client names in Accounts Receivable, to get an idea of what was coming in. Prepared six invoices—and atOnce! calculated sales tax. Nice. Printed the invoices which I redesigned in atOnce!—realign a field here, change a font there. The usual.

Then ran a Customer Aging Report to identify the slow-payers (I had no idea such a terrific thing was even possible).

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I discovered a key client who hadn't paid in two months. I called

and collected and now *he* wants to know about atOnce! I wrote payroll checks for the staff, and sent our bank a balance sheet I printed out myself—no sweat.

From fear and loathing to passion. Now I even study the management reports atOnce! generates.

I'm still an art director. But atOnce! helped me become a better businessman!

A hidden bonus that made my day

When our bookkeeper returned, I showed her atOnce! Now she's back doing the books, even makes sure my plants are green, and I can supervise like a boss should. Putting the books on the Mac gives me the numbers I need when I want them. It lets me take control of income and expenses.

Here's some free advice: Take control of your *own* business. Buy atOnce!



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PickTure 1 1/2

Picture this. You want to edit a picture file you created ages ago in MacPaint but you've forgotten what you named it. Using the Open dialog box, you wander around in your hard-disk labyrinth, searching for a name that rings a bell. Ten minutes later, you still haven't found it.

Enter PickTure. Billed as a visual file selector, PickTure is a startup/Control Panel device (INIT/cdev) that radically alters the look and use of the Open dialog box. PickTure adds rows of miniature screen shots of all the files a selected application can open. You open the files by double-clicking on the miniatures. PickTure also adds a cluster of radio buttons that you can use as shortcuts to navigate between scattered folders, even those that reside on different hard disks. You set up the predefined path between two folders for PickTure to follow, assign the path a radio button, and click on the button to

jump directly from one folder to another.

The radio buttons work in all applications that have an Open command, but you must designate which programs will use the miniature "picktures." Once a program has been marked for miniatures, PickTure takes a snapshot of what a file looks like, as it is closed or saved, and then saves the snapshot as a resource in the file. Consequently, when you first run PickTure, there won't be any miniatures on display. You can either accumulate them as you work or ask PickTure to automatically create them for all the files a selected application can open.

PickTure can create miniatures of both graphic and text files. It actually takes several snapshots so that it can display in color as well as black-and-white. To store the picktures, the PickTure resource adds about 1K to each file on monochrome Macs and about 6K on color systems.

To better manage pickture files, the software lets you rename and delete files from the Open dialog box. It also has a handy search button that swiftly moves

among nested folders, locating all the files a selected application can open.

PickTure works amazingly well, but on slower machines you may notice a lag between closing a file and having it go away while PickTure updates the miniature. Another annoyance is that the selected miniature isn't always shown with its corresponding filename, which gets confusing. Noticeably missing is a button that creates a new folder.

Predictably, PickTure doesn't work with other utilities or INITs that modify the Open dialog box (such as Super Boomerang and Directory Assistance). The program provides a workaround to this by letting you mark the conflicting software on the Control Panel, so that PickTure will know to leave that application alone.

Overall, PickTure qualifies as a good Mac utility. It's easy to use, graphical, and incredibly convenient.

Right Answers, Box 3699, Torrance, CA 90510; (213) 325-1311. Version 1.0. \$89.95.

— Dave Valiulis

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*Steve Costa, *MacWEEK*, 10/3/89. ***MacUser* 1989: Editor's Choice, 5 Mite Rating, and Eddy Award for Best Utility. *Macworld's* 1990 Reader's World Class Award. *Publish's* 1989 Reader's Choice Award. Best seller through National Distributors: Ingram Micro D, Softsel, Kenfi. SUM is a trademark of Symantec Corporation.

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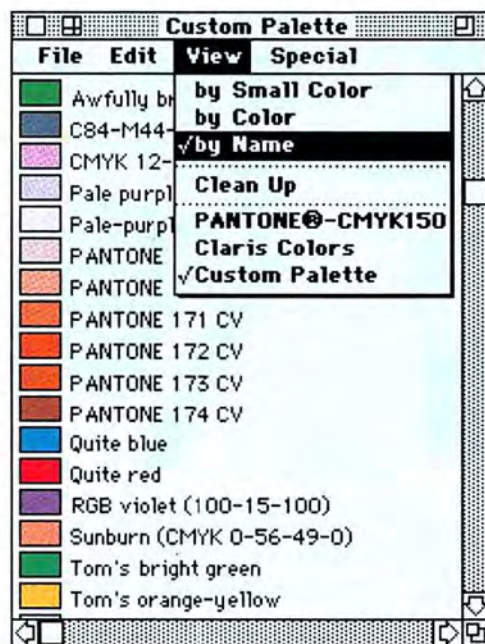
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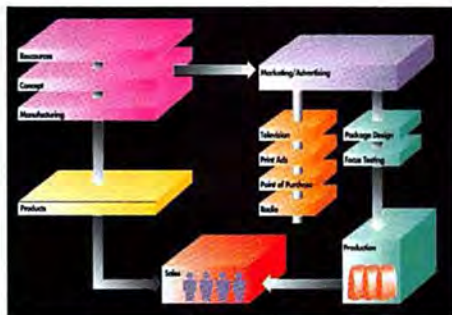
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AND
DARRYL CHAN



At long last, System 7.0 has made it out Apple's doors and onto the shelves of your local dealer. Apple hasn't

been shy about letting us know what goodies we can expect with the new System, but it kept a tight lid on the details of pricing, availability, and technical support until the day System 7.0 actually shipped. Now, however, the full story can be told. (If you'd like a tour of System 7.0's features, see "70 Things You Need to Know About System 7.0," June '91, page 96, or check out Apple's on-line tour of System 7.0, available on many bulletin-board services.)

System 7.0

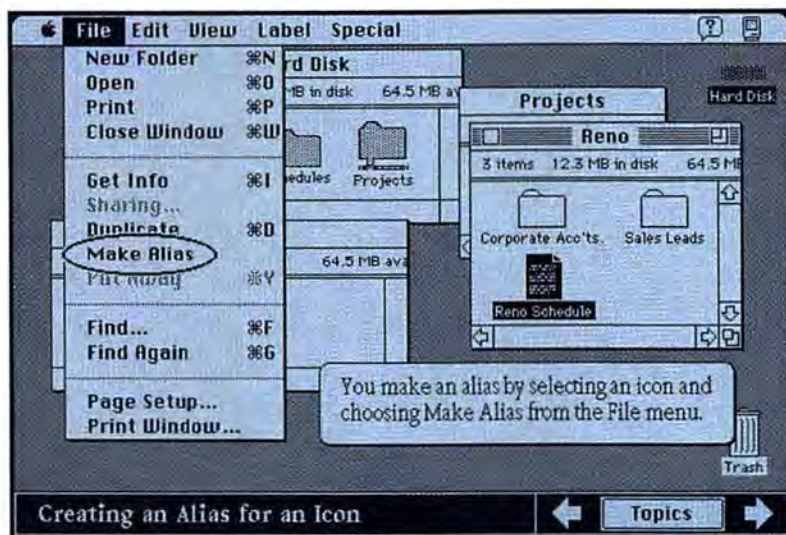


Figure 1: The Before You Install disk, included with the Personal Upgrade Kit, gives you a tour of new System 7.0 features such as aliases, file sharing, and the new Finder.

First things first: Where can you get your hands on a copy of the software that Apple promises will give you "practically a new Mac"? The obvious place to start is at your dealer, where, depending on your needs, you can get the Personal Upgrade Kit or the Group Upgrade Kit.

The Personal Upgrade Kit

This option is designed for individual users and was tentatively priced at \$99 at press time. Here's what you get:

- Eight disks of software, including the Installer, System files, printer drivers, core TrueType fonts, AppleShare client software, and the usual extras such as TeachText and Disk First Aid.

- Two orientation disks, *Before You Install* and *Macintosh Networking Basics*. *Before You Install* includes the Compatibility Checker (a HyperCard stack that scans your system for hardware and software incompatibilities) and a tour of System 7.0's new features (see Figure 1, above, and "Converting to System 7.0," elsewhere in this issue). The *Macintosh Networking Basics* disk includes an introduction to networking concepts such as the Chooser and file sharing.

- A scaled-down HyperCard package consisting of two disks. One contains HyperCard 2.1, the System 7.0-friendly version; the other holds basic HyperCard stacks. (More full-featured HyperCard upgrade packages are available from Claris.)

- Four manuals: *What's New in Macintosh System Software, Version 7.0*, a 25-page booklet that outlines the major new features; the *Macintosh Reference Guide*, a 300-page manual; the *Macintosh Networking Reference Guide*; and *Installing System Software, Version 7.0*.

- As a complement to the Compatibility Checker, a printed

checklist containing about 150 of the most commonly used Mac applications that indicates whether or not these programs are compatible with System 7.0.

The Group Upgrade Kit

This upgrade option (tentatively priced at \$349) is designed for companies that will be upgrading several Macs either individually or over a network (see "System 7.0 on a Network," in this issue's Bridges section). It comes with a site license so that you can upgrade your entire organization. With the Group Upgrade Kit, you receive everything included in the Personal Upgrade Kit as well as a CD-ROM that contains the following:

- An Installer that upgrades multiple Macintoshes to System 7.0 at the same time from a CD-ROM mounted on the network.

- A separate printer installer for upgrading the printer-driver files of Macs that continue to run under System 6.x.

- A System 6.x folder that contains versions 6.0.7, 6.0.5, 6.0.4, and 6.0.3 of System software for those who need to reinstall earlier versions.

- Disk images of the 800K and 1.4-megabyte floppy versions of System 7.0 so that you can make a floppy-disk copy of the System software for each user.

- Miscellaneous utilities such as the Namer (for naming printers).

- Electronic versions of all the documentation and the licensing agreement.

You receive four manuals with the Group Upgrade Kit: *What's New in Macintosh System Software, Version 7.0*; *Installing System Software, Version 7.0*; the *Macintosh Reference Guide*; and the *System 7.0 Group Upgrade Guide*, which describes how to upgrade an organization to System 7.0. You can also get additional copies of the manuals. Dealers will be selling \$249 "five packs," each containing five copies of *What's New in Macintosh System Software, Version 7.0*; the *Macintosh Reference Guide*; and the *Macintosh Networking Reference Guide*.

Software by Subscription

If you want to install System 7.0 right away but don't like the idea of having to buy any upgrades that are released later this year, check out Apple's new System Software Update Program. Available through dealers, this \$160 program buys you the current System software as well as any upgrades released during a one-year period. The program is currently available for the Personal Upgrade Kit only, although Apple may institute a similar program for the Group Upgrade Kit.

System 7.0 will also be available from user groups (probably for less than what you would pay a dealer) and also from on-line services such as CompuServe and America Online. (The only cost you have if you take the on-line approach is the download charge, but that can add up to the purchase price of a Personal Upgrade Kit.) Buying your own shrink-wrapped copy has additional advantages: Not only do you get all the documentation but you also get free phone support — 90 days with the Personal Upgrade Kit and 180 days with the Group Upgrade Kit. Given that System 7.0 is a major upgrade that may cause both you and your system more than a few problems, phone support is a valuable feature for which it's worth paying extra.

You won't be completely without help, however, if you download a copy of the software or get a copy from a user group; Apple has set up a 24-hour phone line with a recorded message that answers the top 20 questions about System 7.0. Phone Apple Customer Support at (800) 776-2333 for the number.

Becoming Seven-Savvy

System 7.0 offers a slew of new features, and most users are waiting for the day their applications can take advantage of them. The important question, however, is whether the programs you use *now* can work with System 7.0 and let you maintain the productivity you had under System 6.x. To help you find the answer, Apple has defined three degrees of 7.0 compatibility for programs: 7.0-compatible, 7.0-friendly, and 7.0-dependent. Here's what those labels mean:

- 7.0-compatible programs do not take advantage of any new features, but they run under version 7.0 without significant problems.

- 7.0-friendly programs can run under earlier versions of the System software, but they also take advantage of some of System 7.0's new features such as balloon help and publish-and-subscribe.

- 7.0-dependent programs won't work correctly unless they're run under System 7.0.

If you're curious about how your programs will function under System 7.0 and whether there's a 7.0-friendly upgrade in the works, see Table 1. This table looks at some popular Macintosh software and reports whether it is 7.0-compatible, whether

7.0-friendly versions are planned, and what features future upgrades may have. Note that *all* the information in the table is subject to change — shipping dates and product features may be altered as the dust settles from the System 7.0 introduction.

Remember too that it's not just software that can have compatibility problems — some hardware (such as video-display and Ethernet cards) might not make the switch to System 7.0 successfully. If you suspect hardware-compatibility problems, call the product's manufacturer.

Leaders of the Pack

A handful of manufacturers have already released System 7.0-friendly upgrades (many were released concurrently with System 7.0), and some firms have introduced brand-new applications that take advantage of System 7.0. Most support System 7.0 features such as balloon help, TrueType, and virtual memory, but a few go a step further. Here are the highlights of a few programs that are leading the way in utilizing the strengths of System 7.0:

Accountant, Inc. 2.2. This small-business-accounting system from Softsync/BLOC takes advantage of System 7.0's Publish feature to let you send accounting data to other applications, such as spreadsheet programs and word processors. Within Accountant, Inc., you can add custom graphics to reports by subscribing to graphics created in spreadsheet or charting programs.

Canvas 3.0. The latest version of Deneba Software's drawing program is a publisher, so individual objects within Canvas documents can be shared across networks. It also lets you manipulate TrueType just as you would any other object — you can resize a block of text by selecting

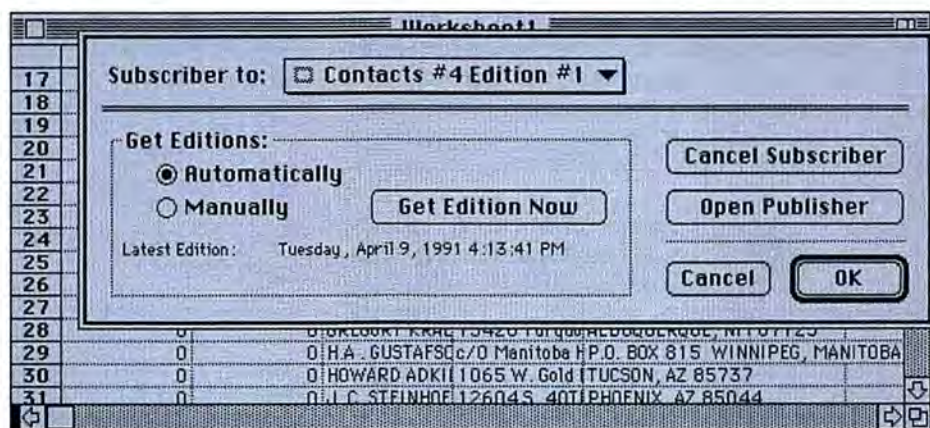


Figure 2: Publish-and-subscribe lets you pass data among applications while retaining a dynamic link to the original file. In this example, part of an Excel 3.0 document has been published (it's now called an *edition*), meaning that it's available to other programs with publish-and-subscribe capabilities as well as to other users, who access the edition by subscribing to it. Whenever the original file is changed, all subscribing files are automatically updated. The Subscriber Options dialog box, shown here, lets you determine whether changes in the published document will be reflected in the subscriber's version automatically or only when the document is saved.

System 7.0

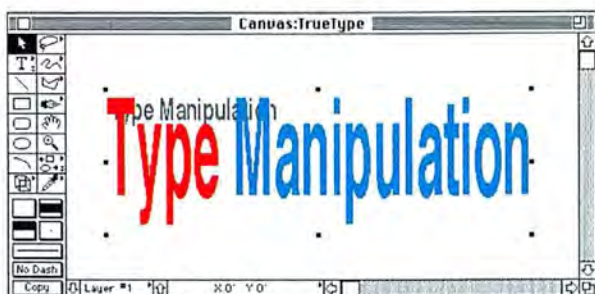


Figure 3: Canvas 3.0 lets you manipulate TrueType as you would other objects. The original type (in gray) was selected with the pointer and then stretched to a larger size without loss in quality.

it with the pointer tool and pulling the corners of the box to make it smaller or larger (see Figure 3).

DiskFit 2.7. This data-backup utility from SuperMac automatically creates an alias of your backed-up files or hard disk and places it on the desktop. When you double-click on this alias, you see a mirror image of your backup. Double-click on an individual file, and you will be prompted to insert the floppy disk, tape, or removable cartridge on which the backed-up file is stored. Because DiskFit backs up files in a Finder-readable format, you don't have to restore the files before accessing them. When backing up, DiskFit retains the access privileges for shared files and folders, and it includes the original document or application (where possible) when backing up folders that contain aliases.

DiskPaper 1.0. This new print-to-disk utility from Farallon lets you share a document electronically with other users, even if they don't have the application with which you created it. Viewers don't even need a copy of DiskPaper, because the viewing software can be embedded within the document. DiskPaper supports TrueType, but it also creates a bit-mapped version of the fonts, so that documents created with TrueType fonts can be viewed by *all* users, even those without the original fonts — and even if their system lacks TrueType capabilities.

Excel 3.0. A major upgrade to Microsoft's popular spreadsheet program, version 3.0 supports publish-and-subscribe (see Figure 2), so you can easily update information across many documents as well as add Excel charts and tables to other applications. Its template feature (also known in System 7.0 lingo as a stationery pad) lets you create documents with common elements; for example, you can save an expense-report worksheet as a template so it can be reused.

RagTime 3.1 with System 7.0 Extensions. RagTime (from RagTime) — an integrated program that includes page-layout, word-processing, spreadsheet, and graphing capabilities — already has its own internal version of publish-and-subscribe called hot linking, which lets you share and automatically update information among RagTime

documents. You can expand this capability with System 7.0 Extensions, a two-disk update to RagTime 3.1 that adds support for publish-and-subscribe. System 7.0 Extensions lets you publish RagTime documents on a frame-by-frame basis (RagTime documents comprise a series of frames containing text, graphics, and spreadsheets). You can also subscribe to documents published from other applications, such as Excel.

Resolve 1.0. This is Claris' new spreadsheet program, specifically designed to take advantage of System 7.0. It supports publish-and-subscribe, so you can easily update and distribute Resolve data, and its IAC capabilities let you use it to analyze and chart data from other applications.

SAM 3.0. SAM (Symantec Anti-Virus for the Macintosh) is the first antiviral utility developed to work with System 7.0 (it also works with earlier System versions). When running under System 7.0, SAM 3.0 can scan applications for viruses as they launch; you can also have applications scanned just by dragging them over to the SAM Virus Clinic icon.

These are not the only programs that are jumping on the System 7.0 bandwagon, but they're a sample of what's being developed. As more users switch to System 7.0, the demand for applications that take advantage of it will grow. You — and your Macintosh — will be seeing some innovative and exciting software developments in the year to come.

Victoria von Biel is an associate editor at *MacUser*; Darryl Chan is *MacUser*'s research assistant.

Table 1 Criteria

Product (Manufacturer) — The current shipping version of the product (the manufacturer's name is in parentheses).

7.0-compatible? — Does the current shipping version work under (without taking advantage of) System 7.0? (Most compatible programs support TrueType.) Special cases are noted with an asterisk.

7.0-friendly version due? — Does the manufacturer plan to market a version of the product that takes advantage of new System 7.0 features such as balloon help and publish-and-subscribe?

When? — The approximate date that the System 7.0-friendly upgrade will ship (these dates are subject to change). 2Q '91 means the second quarter of 1991.

System 7.0 features — Will the product take advantage of the following three features:

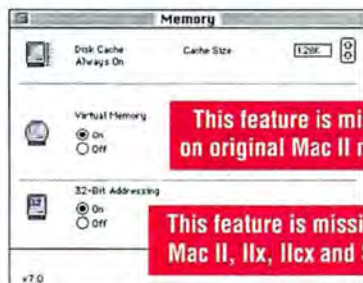
- **Balloon help** — On-screen help that pops up in a comic-book-style balloon when an item is pointed to.

- **Publish-and-subscribe** — The ability to pass text or graphics among applications while retaining a dynamic link to the original file.

- **TrueType support** — Apple's new outline-font technology. TrueType fonts use a single font-outline file to scale fonts to any size, and no separate bit-mapped-font file is required for output.

You could be missing the best parts of System 7.0

If you have a Mac II, IIx, IIcx or SE/30, make sure you get 32-bit mode and virtual memory



System 7.0 Memory Control Panel.

Your Macintosh II, IIx, IIcx or SE/30 doesn't have the 32-bit capability of the most recent systems. So you won't get 32-bit mode when you upgrade to System 7.0. You'll be missing out on a powerful new technology which can allow you to access much more memory and run programs faster.

That's why we created MODE32™, a simple, affordable software solution that enables older Macs to run in 32-bit mode.

More memory for more productivity

MODE32 breaks through the 8 megabyte memory barrier to access up to one full gigabyte of virtual memory, or as much physical RAM as you can put in your Mac.

With increased memory, applications will run faster and more programs can run concurrently. This increases productivity, especially in memory-intensive applications such as desktop publishing, multimedia and image processing.

MODE32 is the 32-bit solution

Unless you have MODE32, your Mac II, IIx, IIcx or SE/30 won't run 32-bit mode – or even display it as an option in the memory control panel. To make your Mac work like the new generation of machines, just copy MODE32 into your system folder.

Here's the best part: MODE32 gives you full 32-bit mode operation under System 7.0 for only \$169.

For the original Mac II, there's another catch

If you have an original Mac II, there is something else you need to know: virtual memory is completely missing, and won't even appear in your control panel. Virtual memory (VM) lets you increase your Mac's memory without having to install additional SIMMs.

Your Mac II needs a Motorola PMMU coprocessor to run virtual memory. Connectix sells the current Mask 73 version of the PMMU, the only version that is known to be fully compatible with the Macintosh. When you upgrade to System 7.0, add a Connectix MC73™ PMMU for only \$179 to get virtual memory on your Mac II.



Upgrade to all of System 7.0's benefits

If you have a Mac II, IIx, IIcx or SE/30, get MODE32 and discover the power of 32-bit operation.

And, if you have an original Mac II, you need the MC73 to enjoy the advantages of virtual memory.

To order MODE32 or an MC73 PMMU, call your supplier or Connectix direct at (800) 950-5880 or (415) 324-0727.



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System 7.0

Table 1: Seven-Savvy Programs

Product name (Manufacturer)	7.0- compatible?	7.0-friendly version due?	When?	Balloon help	Publish-and- subscribe	TrueType support	Comments on 7.0-friendly version
4th Dimension 2.1.1 (ACIUS)	●	●	summer '91	●	●	TBD	
Accountant, Inc. 2.1 (Softsync/BLOC)	○	●	July '91	●	●	●	Uses Apple events to create links with forms-design programs.
Adobe Type Manager 2.0 (Adobe)	●	●	TBD	TBD	NA	NA	
Canvas 3.0 (Deneba)	●	●	shipping	●	●	●	Uses custom Apple events to interact with Voice Navigator II.
Claris CAD 2.0 (Claris)	●	●	TBD	●	●	●	
Color MacCheese 2.07 (Delta Tao)	●	●	May '91	●	○	●	
ColorStudio 1.5 (Letraset)	●	●	summer '91	●	●	●	
DeltaGraph 1.5 (DeltaPoint)	●	●*	summer '91	●	●	●	*Released as DeltaGraph Professional.
DesignStudio 2.0 (Letraset)	●	TBD	TBD	TBD	TBD	TBD	
DeskPaint and DeskDraw (Zedcor)	●	●	Aug. '91	●	●	●	
Digital Darkroom 2.0 (Silicon Beach)	●	TBD	TBD	TBD	TBD	TBD	
DiskDoublers 3.1 (Salient)	○	●	June '91	●	NA	NA	Uses custom Apple events to enable any program to access it for file compression.
DiskExpress II 2.04 (ALSoft)	○	○*	NA	○	○	○	*Version 2.07 (May '91) is 7.0-compatible only.
DiskTop 4.0.1 (CE Software)	○	●	3Q '91	●	NA	NA	
Double Helix 3.5 (Odesta)	●	●	TBD	○	●	●	
Dreams 1.1 (idd)	●*	TBD	TBD	TBD	TBD	TBD	*Problem choosing Revert command.
Excel 3.0 (Microsoft)	●*	●	shipping	●	●	●	*Previous version (2.2) is 7.0-compatible.
FileForce 1.1 (ACIUS)	●	●	summer '91	●	●	●	
FileMaker Pro 1.0 v. 2 (Claris)	●	●	TBD	●	●	●	
Fontographer 3.3 (Altsys)	●*	○	NA	○	NA	●	*Current version can create TrueType fonts.
FrameMaker 3.0 (Frame)	●	●	Sept. '91	●	●	●	
FreeHand 3.0 (Aldus)	●	●	TBD	●	●	●	
Full Impact 2.0S (Ashton-Tate)	○	●	TBD	●	TBD	●	No plans to make future releases 32-bit clean.
FullWrite 1.5S (Ashton-Tate)	●	TBD	TBD	TBD	TBD	TBD	
HyperCard 2.0 (Claris)	●	●	May '91	○	○	●	Uses custom Apple events to launch other applications.
Illustrator 3.0 (Adobe)	●*	●	TBD	TBD	●	●	*Current version does not support TrueType.
M.Y.O.B. 2.0 (Teleware)	●	●	June '91	●	●	●	
MacDraft 2.1 (idd)	●	●	TBD	●	●	●	
MacDraw II 1.1 (Claris)	●	○*	NA	○	○	●	*Released as MacDraw Pro (June '91). Future releases of MacDraw Pro will support balloon help and publish-and- subscribe.
MacInTax 1990 (SoffView)	●	●	4Q '91	●	●	●	
MacPaint 2.0 (Claris)	●	TBD	TBD	TBD	TBD	TBD	

Legend

● = yes

○ = no

TBD = to be decided

NA = not applicable

Introducing the
first computer
in history that's
easier to use
and more
powerful than
a Macintosh.

System 7.0

Table 1: Seven-Savvy Programs, continued

Product name (Manufacturer)	7.0- compatible?	7.0-friendly version due?	When?	Balloon help	Publish-and- subscribe	TrueType support	Comments on 7.0-friendly version
MacProject II 2.1 (Clarisc)	●	●	June '91	○	○	●	Uses custom Apple events to launch other applications.
MacroMind Director 2.0 (MacroMind)	●	●	summer '91	●	TBD	●	
MacTIPS 3.0 (Sitka)	○	●	3Q '91	○	NA	NA	Supports Alias Manager over a network.
MacWrite II 1.1 (Clarisc)	●	●*	summer '91	●	●	●	*Released as MacWrite Pro.
MasterJuggler 1.53 (ALSoft)	○	TBD	TBD	TBD	TBD	TBD	Will be System 7.0-compatible or new product.
Metamorphosis Professional 2.0 (Altsys)	●*	○	NA	○	NA	●	*Current version can convert TrueType fonts.
MicroPhone II 3.0 (Software Ventures)	●	●	June '91	●	TBD	●	Supports the Communications Toolbox.
Microsoft Mail 3.0 (Microsoft)	●	TBD	TBD	TBD	TBD	TBD	
Microsoft Word 4.00D (Microsoft)	●	●	TBD	●	●	●	
Microsoft Works 2.0 (Microsoft)	●	TBD	TBD	TBD	TBD	TBD	
MindWrite 2.1 (DeltaPoint)	●	○	NA	NA	NA	NA	Product replaced with Taste 1.0.
MORE 3.0 (Symantec)	●	TBD	TBD	TBD	TBD	TBD	
Nisus 3.05 (Paragon Concepts)	○	●*	Aug. '91	●	●	●	*Instead of a new version, will be an upgrade module. A 7.0-compatible-only upgrade will be available free from on-line services and Paragon Concepts.
Norton Utilities for the Macintosh 1.0 (Symantec)	○	●	summer '91	●	NA	●	
Oasis 1.0 (Time Arts)	●	●	3Q '91	●	●	●	
PageMaker 4.01 (Aldus)	●	●	TBD	●	●	●	
Personal Press 1.0 (Silicon Beach)	○	●	May '91	TBD	TBD	●	
Persuasion 2.0 (Aldus)	●	●	TBD	●	●	●	
Photoshop 1.0.7 (Adobe)	●	●	TBD	TBD	●	●	
PixelPaint 2.1 (SuperMac)	●	TBD	TBD	TBD	TBD	TBD	
PixelPaint Professional 2.0 (SuperMac)	●	●	shipping	●	●	●	
PowerPoint 2.01 (Microsoft)	●	TBD	TBD	TBD	TBD	TBD	
Publish It! Easy 2.0 (TimeWorks)	○	●	2Q '91	●	○*	●	*Publish-and-subscribe will be in future versions.
QuarkXPress 3.0 (Quark)	●*	●	3Q '91	●	●	○	*Does not support TrueType.
QuickKeys 2.0.1 (CE Software)	○	●	June '91	●	NA	NA	
QuickMail 2.2.3 (CE Software)	○	○*	NA	○	NA	NA	*New version (May '91) is 7.0-compatible but not 7.0-friendly. It will support the Communications Toolbox.

Legend

● = yes

○ = no

TBD = to be decided

NA = not applicable

Congratulations. You already own it.

System 7 is here. The biggest improvement in Macintosh since Macintosh.

System 7 brings many new and exciting capabilities to Apple® Macintosh® computers. It also makes the computer that's famous for being easy to use even easier.

But what's really exciting is the fact that the Macintosh computer sitting there on your desktop has the power to take advantage of all these advanced capabilities.

System 7 can run on every Macintosh personal computer we've built since 1986.

(All you need is a hard disk drive and at least two megabytes of memory.)

It's like getting a whole new Macintosh without buying a whole new Macintosh.

And while we have been busy reinventing your Macintosh, the best software developers in the world have been busy, too. Creating the next generation of Macintosh software. Bringing new powers to your favorite Macintosh applications. And creating new programs that will enable your Macintosh to do things no other personal computer has ever done before.

System 7 is just the latest example of how Apple moves technology ahead without leaving you behind. To not only protect your invest-

ment, but also to make it worth more than ever.

To make the transition easy, we've prepared two System 7 Upgrade Kits.

The Personal Upgrade Kit is for individual users and contains everything you need. Including System 7 software, a compatibility checker, HyperCard® 2.1 software, a comprehensive manual and 90 days of toll-free upgrade assistance from Apple.

The Group Upgrade Kit is designed for managers of large Macintosh installations. It will let you upgrade your entire network quickly and easily. And it includes System 7 software, the compatibility checker, HyperCard 2.1, a special Macintosh guide to networking and 180 days of toll-free upgrade assistance.

For information on upgrade kits, call your authorized Apple reseller. For the name of the reseller near you, call 800-538-9696, ext. 777.

And rediscover the power no other computer can offer. The power to do more than ever.

The power to be your best.®

Introducing System 7 for Macintosh.

System 7.0

Table 1: Seven-Savvy Programs, continued

Product name (Manufacturer)	7.0- compatible?	7.0-friendly version due?	When?	Balloon help	Publish-and- subscribe	TrueType support	Comments on 7.0-friendly version
RagTime 3.1 (RagTime)	●	●	May '91	●	●	●	
Retrospect Remote 1.2 (Dantz)	●*	●	May '91	●	NA	NA	*Automatic shutdown doesn't work.
SAM 3.0 (Symantec)	●	●	shipping	●	NA	NA	
Smartcom II 3.2A (Hayes)	●	●	TBD	TBD	TBD	TBD	
StrataVision 3d 1.4.2 (Strata)	○	●	Oct. '91*	●	●	●	*Compatible version (2.0) May '91; full support for System 7.0 will be in Oct. '91 release.
Studio/1 1.0 (Electronic Arts)	●	●	TBD	●	●	●	
Studio/32 1.1 (Electronic Arts)	●	●	4Q '91	●	●	●	
Studio/8 2.0 (Electronic Arts)	●	●	TBD	●	●	●	
StuffIt Deluxe 2.0.1 (Aladdin)	●	●	July '91	●	NA	●	
Suitcase II 1.2.9 (Fifth Generation)	●*	●	TBD	●	NA	●	*Current version supports TrueType.
SUM II 2.0 (Symantec)	●	●	summer '91	●	NA	NA	
SuperCard 1.5 (Silicon Beach)	○	○*	NA	○	○	○	*New version will be 7.0-compatible but not 7.0-friendly. Shipping date not decided.
SuperPaint 2.0A (Silicon Beach)	●*	TBD	TBD	TBD	TBD	TBD	*Screen-refresh problems with scroll bar.
Super3D 2.1 (Silicon Beach)	○	○*	NA	○	○	○	*New version (May '91) will be 7.0-compatible but not 7.0-friendly.
Swivel 3D Pro 1.5.73 (Paracomp)	●	●	Aug. '91	●	●	NA	
Taste 1.01 (DeltaPoint)	●	TBD	TBD	TBD	TBD	TBD	
Tempo II Plus 2.0.1 (Affinity)	○	○*	NA	○	NA	NA	*Compatible version 2.1 ships May '91; shipping date of 7.0-friendly version undecided.
Timbuktu 4.0 (Farallon)	●*	●	shipping	●	NA	●	*Version 3.1.2 is not 7.0-compatible. New version can share screens between Macs running Systems 6.x and 7.0.
TypeStyler 1.5 (Brøderbund)	●	TBD	TBD	TBD	TBD	TBD	
UltraPaint 2.0 (Deneba)	●	●	Aug '91	●	●	●	
Ventura Publisher 3.0.1 (Ventura Software)	●	●	Aug '91	●	●	●	
Voice Navigator II 2.0 (Articulate)	○	●	Aug. '91	●	NA	NA	
WingZ 1.1A (Informix)	●	TBD	TBD	TBD	TBD	TBD	
WordPerfect 2.0 (WordPerfect)	●	●	Aug. '91	●	●	●	
WriteNow 2.2 (T/Maker)	●	●	3Q '91	●	TBD	●	

Legend

● = yes

○ = no

TBD = to be decided

NA = not applicable



CLAIMS Vs. ACCLAIMS

A lot of manufacturers say they have the best trackball, but only the Kensington Turbo Mouse® has the awards to prove it.

MacUser gave it the coveted Five Mice. And the readers of Macworld magazine voted it "Best Input Device" — not just once but *four years in a row*.

What makes Turbo Mouse outshine the rest?

Superior optical hardware and unique software are the difference.

A light click sends the signal quietly and instantly.

One button transmits a normal mouse command. The other locks the button in the down position for extended selection and graphic applications. You decide which button performs what function.

Press both buttons simultaneously, and our time-saving chording



feature executes one of seven useful commands such as "save," "print," "quit," or "undo."

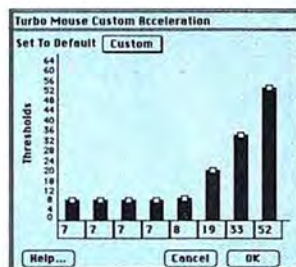
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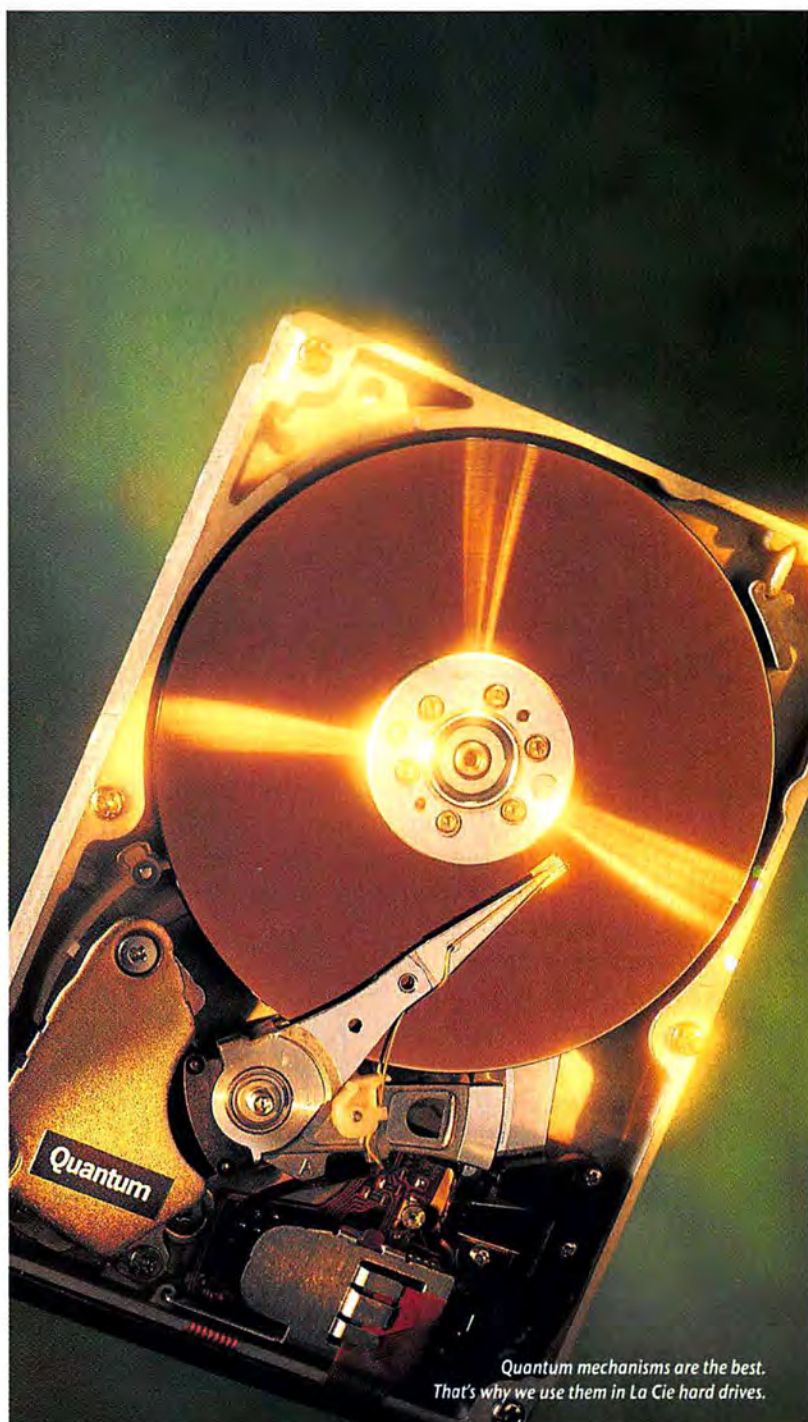
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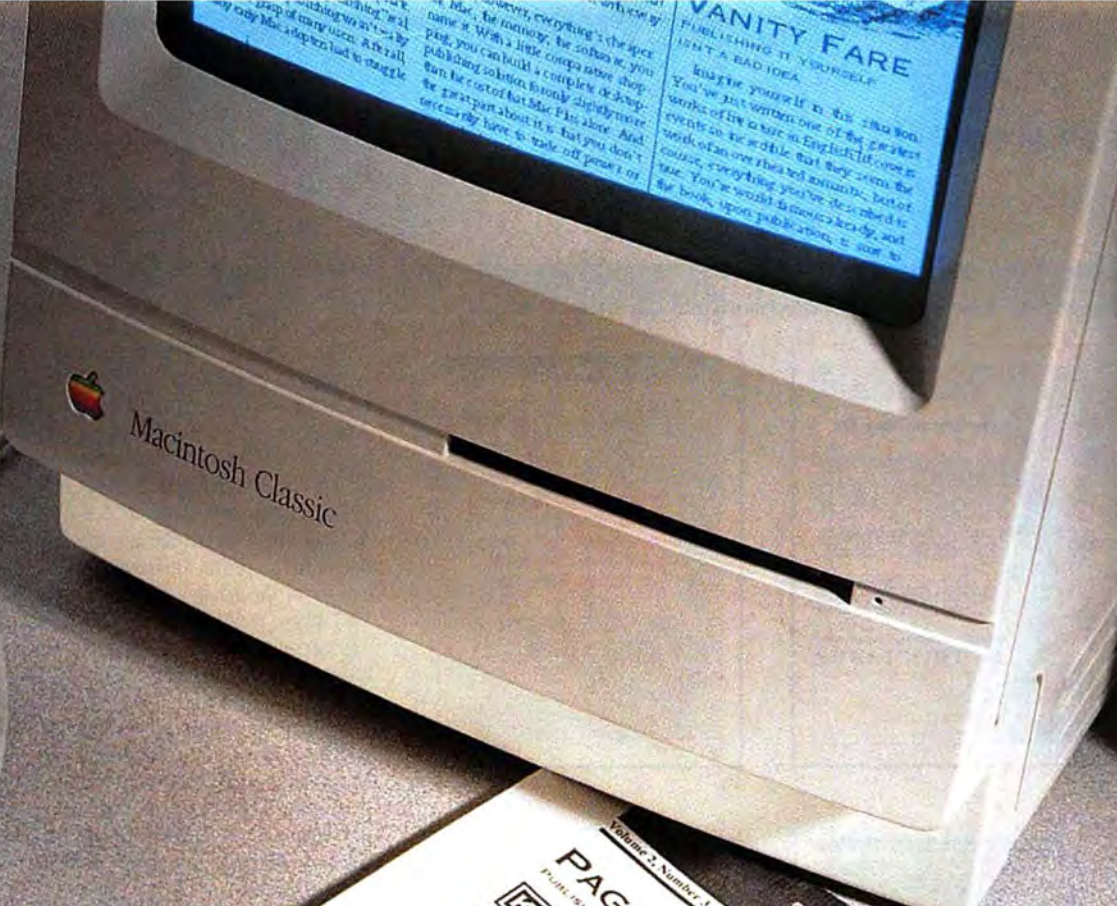
Desktop publishing was originally labeled — or perhaps libeled — as a low-end version of typesetting. But as programs such as PageMaker and QuarkXPress have grown in sophistication — and price — the need for less expensive, simpler alternatives has also grown. And with the advent of cheaper Macs and printers, that need has grown even greater.

Fortunately, developers have responded, and now there are five programs aimed specifically at DTP users who design smaller projects such as newsletters, fliers, and reports: Personal Press, Publish-It! Easy, RagTime Classic, Ready, Set, Go!, and Springboard Publisher II. To test them, we specced out a four-page newsletter (see Figure 1) that incorporated various kinds of graphics and typographical elements and then we tried to realize those design specs with each product. Here's how the five programs fared.

●
BY GREGORY WASSON

PHOTOGRAPHY: STEVE UNDERWOOD





PAGES FOR PAUPERS
The Provident Publisher
Summer 1991

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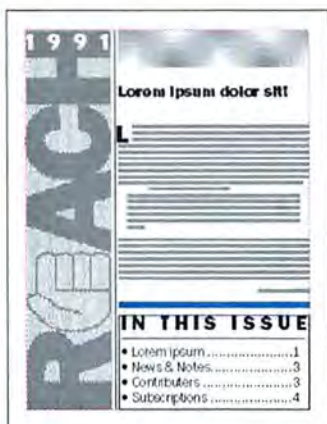
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Figure 1: A Model Newsletter



1a



1b



1c



1d

Figure 1a: The cover of our fictitious newsletter includes an Illustrator 3.0 (EPS) logo with space for a reversed-out date above it. There's a screen beneath the logo and another screen at the top of page. Other elements include a three-line drop cap, a jump line, and a table of contents with leadered tabs and a spread heading.

Figure 1b: A scotch rule with spot color sets off the inner two pages. There's a byline style and a screen for the author's bio. The Excel chart is a PICT image. You must draw the intercolumn rules, and the page number is designed as a reversed-out character in an opaque box with a bottom rule.

Figure 1c: The master-page elements (scotch rule and reversed-out page number) are repeated on page 3. A jump line references the cover story, which ends here with an EPS accent. News & Notes is a special heading style that requires forced justification and a 50-percent gray tint applied to selected words. A Photoshop TIFF halftone completes the page.

Figure 1d: There are no master elements on page 4. Various rules are used in the mailing area. The subscription form includes rules, leadered tabs, a special text header fitted to a specific width, and a gray tint applied to some words. The form must be rotated 180 degrees and positioned at the page top for bulk mailing.

Personal Press

At 780K, Personal Press (see Figure 2) is the largest of the programs we reviewed, and a lot of dandy features have been packed into those kilobytes.

Personal Press' Publication Setup dialog box is one of the nicest you'll ever see. It is here that you define the page size, number of pages, margins, and other elements in your publication. You can choose to have the program generate linked or unlinked text frames, according to the margin and column settings you select. A preview in the dialog box dynamically updates to display the rough appearance of the document as you define values. After you've clicked on OK, your document appears.

We used Personal Press' master, or background, pages to set up and format the page numbers (automatic counters that you insert). As with all text editing in Personal Press, you have to be in the 100% view. The newsletter's page numbers were designed as reversed type in black boxes. In

Personal Press, you create a small text frame; specify the font, color (white), and point size of the page counter; insert it; and set the text frame to have a black fill. We drew a pair of rules at the top of the page with one of the program's draw tools to form a scotch rule.

We set the color of the rules via the Spot Color palette. It's a bit clumsy to do, because Personal Press doesn't automatically select a graphic after you've drawn it—you have to select the graphic and then apply a color. You can choose from the basic eight Mac colors, but the newsletter design required some of the text in the special headings to be gray. Because Personal Press can't specify tints for text colors, we resorted to a workaround. The program lets you modify any one of the eight spot colors with the Apple Color Picker, so we changed one we didn't plan to use in the publication (yellow) to gray and then selected the special headings and clicked on gray on the Spot Color palette.

After we'd readied the master pages, we turned to the

actual pages and prepared them to receive imported text. In the best of circumstances, you want to be able to define style sheets so that your newsletter has a consistent look. Personal Press provides some of the power of a style sheet in its Custom Styles option. A custom style is simply a collection of text-attribute settings (bold, italic, font, point size) that you've saved under one name. It speeds up text formatting, but you can't use Custom Styles to establish alignment, indents, and the like. Also, if you edit a style, text with that style won't automatically update; you have to reapply it manually. To get around this limitation, we used a collection of custom styles for the article-title, body-text, and caption formatting, followed by a separate formatting pass for all the paragraph indents and alignments.

The back page of the newsletter was set up with two text frames to hold boilerplates: the mailing-label area and a subscription form. The subscription form was the most troublesome, because it involved a tabular arrangement. Fortunately, Personal Press' tabs ruler bears no resemblance to its counterpart in PageMaker. It can be sized — you don't have to scroll around to see the full width of a column. We set up a tab structure, using the underline character as the leader to create the fill-in lines for the form. The newsletter was designed to be folded in half for mailing, so we had to rotate the form text block. In Personal Press, you can rotate text objects and graphics by 1-degree increments, so this wasn't a Herculean task.

Other text effects in the newsletter's design were fitted text and drop caps. Personal Press doesn't have a Set Width command or forced justification to achieve this kind of effect, so we resorted to a pre-PageMaker 4.0 trick: the use of Option-spaces after a heading to make it stretch across the frame. (Another way is to use a text utility such as TypeAlign.)

The drop caps were easy to fashion. You just create a separate text frame with the letter, format it, and use text

wrap to make the drop-cap text frame repel the surrounding text. When you drag the frame over the main text frame, the body text shrinks away.

Once you've set up this sort of design, you should think about saving your document as an AutoCreate template (see Figure 3). This wonderful feature lets you assign text or graphic files to specific frames within a miniature mock-up of your document. You simply click on a frame and choose an external file from a list in the AutoCreate dialog box. When you've finished, a new document opens with all the text and graphics inserted. Then you fine-tune and format the text. You can do your text entry within Personal Press (it provides a spelling checker and search capabilities), but it's faster to use a word processor. Personal Press accepts files in nine different formats, including the four standard formats — MacWrite 4.5/5.0, Word 3.0/4.0, WriteNow, and ASCII — and RTF.

Personal Press can flow text from page to page, but although the frames can be linked, Personal Press can't create automatic jump lines ("continued on . . ."). These require separate text frames. Our newsletter design included a short screened biography of the author at the end of an article. Personal Press' graphics-tool palettes came in handy for creating the screened bio box, which was put in last, because it couldn't be anchored to the text.

Finally, we imported EPS, PICT, and TIFF graphics and resized and cropped all these images within Personal Press. (Personal Press can also import a large variety of other graphics formats). If you use the AutoCreate feature, you can size and crop the images before you import them. The Excel PICT chart on page 2 of the newsletter involved using the Text Wrap command as described earlier. We modified the TIFF halftone somewhat with the built-in Digital Dark-room-like image and halftone controls (including Dark-room's Advanced Halftones option).



Figure 2: Personal Press' main window is an elegant and easy environment to work in. Personal Press can rotate text as well as graphics, so it was easy to rotate the subscription form 180 degrees.

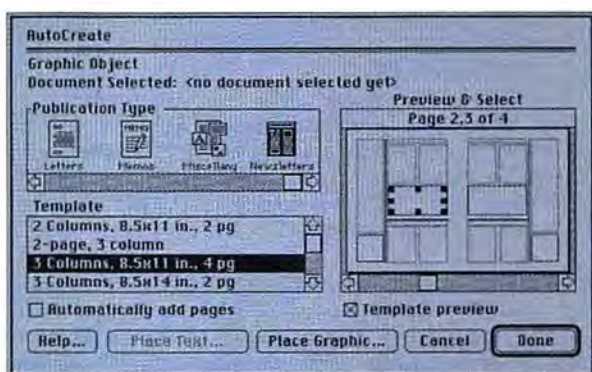


Figure 3: Personal Press' AutoCreate option lets you create layout templates that can be used to complete an initial layout rapidly. By selecting a frame and picking a file from the list, you can open directly to a document that has all the elements already placed.

Page Layout

Personal Press has features that weren't even required for the newsletter. The two most attractive are an excellent story-navigation system called Link Navigator and libraries called Workbooks that can store graphics and text.

All in all, Personal Press made the process of putting the newsletter together almost pleasurable.

Publish-It! Easy

Publish-It! Easy proved well equipped to handle the task of setting up the newsletter, and because it's the smallest of the programs we looked at (320K), it's the best choice for those restricted to floppy disks or with limited RAM.

Publish-It! Easy doesn't provide a new-document dialog box when you launch the program. A standard one-page document just appears. It's not hard to make the format changes — columns, page size (including custom sizes), and so on — but Publish-It! Easy makes the process confusing by spreading out the relevant commands over more than one menu.

Once we'd set the basic parameters, it was off to the master pages. Publish-It! Easy's drawing tools made short work of the scotch rules; they could even be grouped and locked so they couldn't be moved accidentally. The basic

array of eight colors is available for use as spot colors, and Publish-It! Easy lets you set tints via the fill-pattern tool.

Like Personal Press, Publish-It! Easy inserts page counters on the master pages. To reverse-out the numbers, we changed the text color with the pop-up Pen Pattern palette. Because the text frame with the number can have a fill, we set that to black. We used the same technique, which is easier than adding boxes with drawing tools, for the bio. You can even select precise percentages by dragging along the gray ramp in the pop-up Fill Pattern pallet.

The main shortcoming of Publish-It! Easy's master pages became apparent in the document itself — you can't turn master elements off. We resorted to opaque white rectangles to "erase" the superfluous parts.

Once we'd set up the columns, we prepared the document for text importation. Publish-It! Easy offers only minimal style support, so text formatting was cumbersome. We found it useful to use a library-page approach — we inserted an extra page at the end of the document to hold formatted text frames such as captions. When we needed text in a certain format, a simple copy-and-paste from this page solved the problem.

The program's controls over various aspects of word and

DTP Tools On-Line

Desktop publishers on a budget should take a look at some of the shareware and freeware available on the various on-line services. Here's a small selection of DTP-related files you can download from the Download & Support Forum on Zmac. The Zmac filename is given first in all capital letters, followed by the name of the Zmac library:

Add/String

ADDSTR.SIT (Library 1 — Applications)

Add/String is a text utility by Jon Wind that automatically cleans up text-only files that are to be imported into page-layout, word-processing, database, or spreadsheet programs as well as exported from these programs to a DOS-based or mainframe computer. It can substitute and remove em dashes, smart quotes, and line feeds all in one pass. Version 2.9.2. Shareware fee, \$25. 95K.

Pica Calculator DA 1.2

PICALC.SEA (Library 2 — DAs)

This self-extracting file contains Jim Lewis' Pica Calculator DA 1.2, with documentation in text and in MacPaint files. Designed specifically for desktop publishing, it lets you make computations that involve a mixture of picas, points, and inches. Full keyboard control. Version 1.2. Shareware fee, \$10. 71K.

Quote INIT

QUOTES.SIT (Library 3 — INITs, cdevs, fkeys)

Quote INIT, by Lincoln D. Stein, substitutes typesetting, or "smart," quotes or apostrophes (the curly ones) whenever you enter "dumb" quotes or apostrophes — " or ' — in any application. Say good-bye to obscure Option-key combinations. Version 2.0. Freeware. 12K.

Varityper ToolKit

VARTYPER.SIT (Library 1 — Applications)

Varityper ToolKit (VTK) is a single application by Ken Winograd that offers several font-related utilities. VTK includes the capabilities of Varityper's former DAs (known as Varityper FontMaster, FontWizard,

FontConflicts, and PSFontFinder) as well as numerous additional utilities. Stuffit required. Version 1.0. Freeware. 62K.

There are also some handy add-ons for the high end of the DTP spectrum that PageMaker or QuarkXPress users will find useful:

CheckList

CHKLIST.SEA (Library 1 — Applications)

CheckList is a must-have PageMaker 4.0 utility by Clyde McQueen. It scans PageMaker 4.0 documents and lists all their fonts, styles, and links. This is a shareware version of a product that appeared commercially from ElseWare late in 1990. Self-extracting, compressed archive. Version 1.0. Shareware fee, \$45. 92K.

FlashEditing XTension

FLASHE.SIT (Library 5 — Scripts and Templates)

The FlashEditing XTension from Reseaux prints a report listing the fonts and images in a QuarkXPress document. It's like CheckList for PageMaker 4.0, but it works within QuarkXPress. Stuffit required. Freeware. 28K.

PM4 ShortCuts DA

PM4SHO.SIT (Library 2 — DAs)

PM4 ShortCuts is a DA created by Paul Sorrick and Mark Teranishi that provides a complete list of all keyboard shortcuts for PageMaker 4.0, neatly arranged in ten categories. This DA also documents several shortcuts and capabilities that are undocumented in the Aldus manuals. Requires Stuffit. Version 1.0. Shareware fee, \$10. 68K.

Freebies

FREEBI.SIT (Library 5 — Scripts and Templates)

The Freebies file contains two separate QuarkXPress XTensions from Quark: FeaturesPlus is a collection of frequently asked for features such as automatic fractions and trapping; NetworkConnection provides expanded network capabilities. Self-extracting archive. Freeware. 86K.



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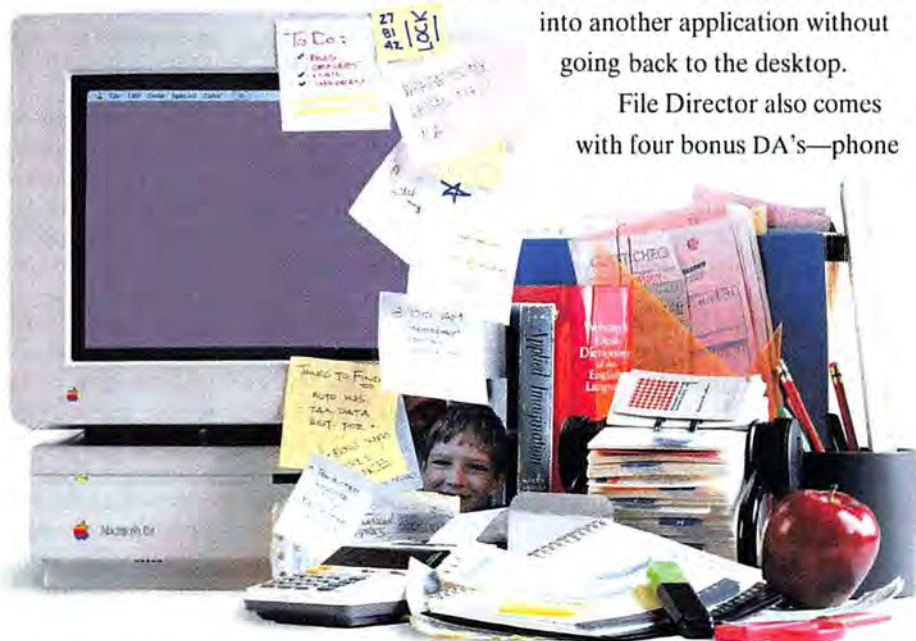
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Page Layout



Figure 4: Publish-It! Easy is a good choice for those with limited storage or RAM. It offers good paint and draw tools; grids; easy-to-create drop caps; and Libraries, on-screen palettes of commands.

character spacing (see Figure 4) made re-creating some of the special headings easier than in Personal Press. The Stretch option in the Text Specifications dialog box tightened or expanded text, and the pen-pattern tool let us assign a gray tint to selected words in the headings. The Forced Justify command was useful for the In This Issue table-of-contents heading.

The subscriptions form on the newsletter's back page posed no major problems. You can rotate text blocks, and tabs are a snap. However, to create the leader, you have to set a tab and then choose a leader style — such as dashes, periods, or underscores — by clicking on the tab while pressing the Option and/or Shift keys.

You can import text from the standard word-processing formats listed earlier. Nothing special here, but one nice touch is that Publish-It! Easy can insert auto-updating jump lines into special text frames.

It was easy to create drop caps — we placed a separate text frame containing the capital letter over another frame with runaround.

Importing graphics went smoothly. You don't have to create a graphic frame first — Publish-It! Easy does it automatically as you import. We just dragged our graphics to their position and then cropped or scaled them. The TIFF import filter offers you image controls and some special effects such as posterizing, which gives the image a silk-screened look, and negative, which reverses-out colors and grays.

Publish-It! Easy is aptly named — it *is* easy. Style sheets would be a welcome addition, but even without them, Publish-It! Easy remains delightful DTP software.

RagTime Classic

If RagTime 3.04 is the Swiss army knife of DTP (see review, June '90, page 70), RagTime Classic, the low-end version of that product, is the rusted blade.

The program is key-disk copy-protected, and the manual is confusing and incomplete — a surprising approach to

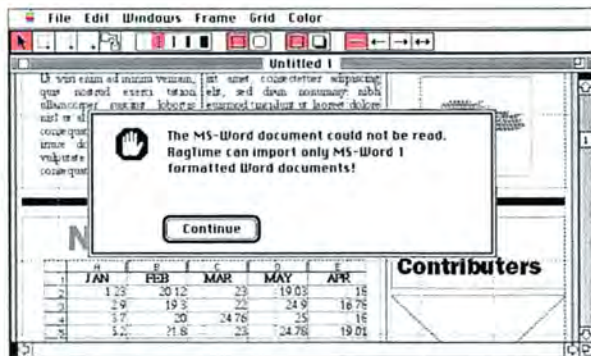


Figure 5: RagTime Classic's spreadsheet capabilities set it apart from other low-end packages, but the program fails miserably in other respects such as text importing. It can import only ASCII, Word 1.0 (not 4.0), and MacWrite 5.0 (not MacWrite II) files.

documentation in a product aimed at the low-end market. Fortunately, RagTime USA offers toll-free support.

RagTime Classic has no initial setup dialog box. As with Publish-It! Easy, you start with a blank page and then go menu hopping. RagTime doesn't offer master pages within a document. You create the left and right page designs and save those two pages as a "form." Then you start a new file and "tear off" either the left or right form page and insert it into your document. It sounds convoluted (and it is), but you can delete or modify individual master elements once you've inserted the form page into your document.

Once we understood the approach, we set up the master elements without a hitch. RagTime Classic can automatically insert column rules, which was a real time-saver. We gave the scotch rules at the top of each page their spot color from the basic eight-color palette. You can also tint these colors, so it wasn't a problem to generate gray screens. To create the reversed-out page counters, we only had to modify the color/tint of the frame's contents, background, and border.

The program doesn't support style sheets, so we used the library-page approach described earlier. Some of the special text effects, however, proved troublesome. We had to create the special headings that had the words in gray and black, with the gray text in a separate frame, and then align it with the black text while Snap to Grid was active — RagTime Classic doesn't let you mix different text colors in the same frame. We created the spread headings in two ways. We used RagTime Classic's character-spacing controls (Command-keypad combinations) to create some headings and TypeAlign to create others. We then imported the TypeAlign text as a resizable EPS graphic.

The subscription form was also problematic, because RagTime Classic doesn't support text rotation or leadered tabs. Ultimately, we imported the form as an EPS graphic.

Once we'd finished the preliminary grunt work, the text came in. Or didn't — at least at first. RagTime, to our astonishment, accepts external text files in only three



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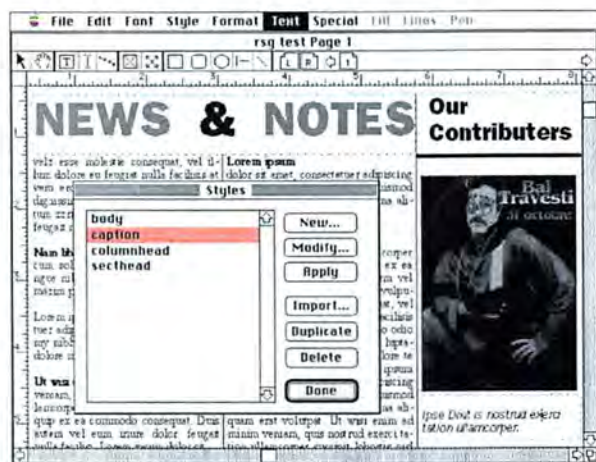


Figure 6: Ready,Set,Go! 4.5 supports style sheets, but Personal Press and Publish-It! Easy outclass RSG in power and features.

formats: ASCII, Word 1.0—not Word 4.0—and MacWrite 5.0—not MacWrite II (see Figure 5).

You can set text frames to repel each other, so the drop caps were no problem. The EPS, PICT, and TIFF graphics came in successfully. Text runarounds were restricted to rectangular borders. RagTime Classic's irritating copy protection, poor documentation, and appalling text-import limitations clearly send it to the back of the pack.

Ready,Set,Go!

Ready,Set,Go! is an old favorite, but it was a surprise to find that Letraset hasn't done much to improve it.

The first step in RSG is to create master pages. We sketched out the scotch rules with the program's drawing tools and applied spot color from RSG's extensive color library—it even offers Pantone support. We reversed-out the page numbers by drawing out a suitably sized text frame and inserting the page counter within it. We then applied white to the counter we selected. We used the same method for creating gray text and the screens for the article bio. We set up a three-column grid, drew out text frames to form the newsletter's columns, and used RSG's linking tool to link the columns. For the main pages, we turned off the cover's master elements and inserted the EPS masthead logo.

RSG supports style sheets (see Figure 6), so it was easy to maintain a consistent structure. You can apply RSG styles to selected characters or entire paragraphs, and these elements update automatically if you edit the style.

RSG's tab ruler is similar to PageMaker's. You have to scroll to see a wide column. It took some time to set tabs, because of the dexterity required to click and scroll through the tab types. We could have set up the subscription form with the tabs, but RSG can't rotate text, so we imported the form as an EPS graphic.

We used Option-spacing to force-justify the heading for the table of contents. You can spread a heading across a line

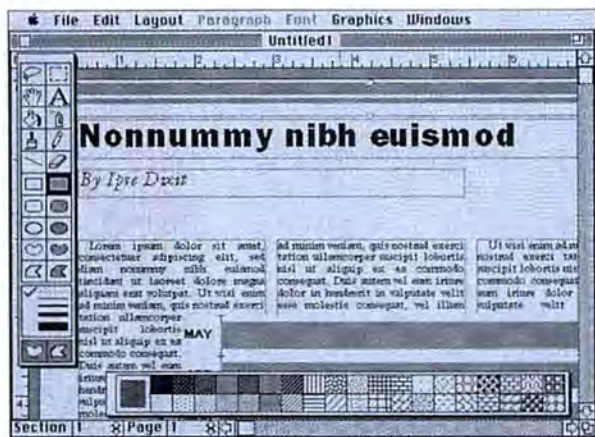


Figure 7: Great graphics tools and a simple design characterize Springboard Publisher II, but overall, it feels more like a word processor than a DTP application.

by mucking around with the character spacing, but Option-spacing is far faster.

RSG can import text from an adequate range of formats, including the standard ones. Once the text was in, we were able to format everything quickly, using the previously defined style sheets. Text runarounds and separate text blocks made forging drop caps similar to doing so in the other programs. There is no provision for automatic jump lines, so it took time to coordinate them—the Glossary feature made it easier. With RSG's typographical controls such as custom kerning and tracking, we could fine-tune headlines and other text.

There were no big surprises in graphics importation. RSG provides text runaround and good halftone controls—second only to those of Personal Press.

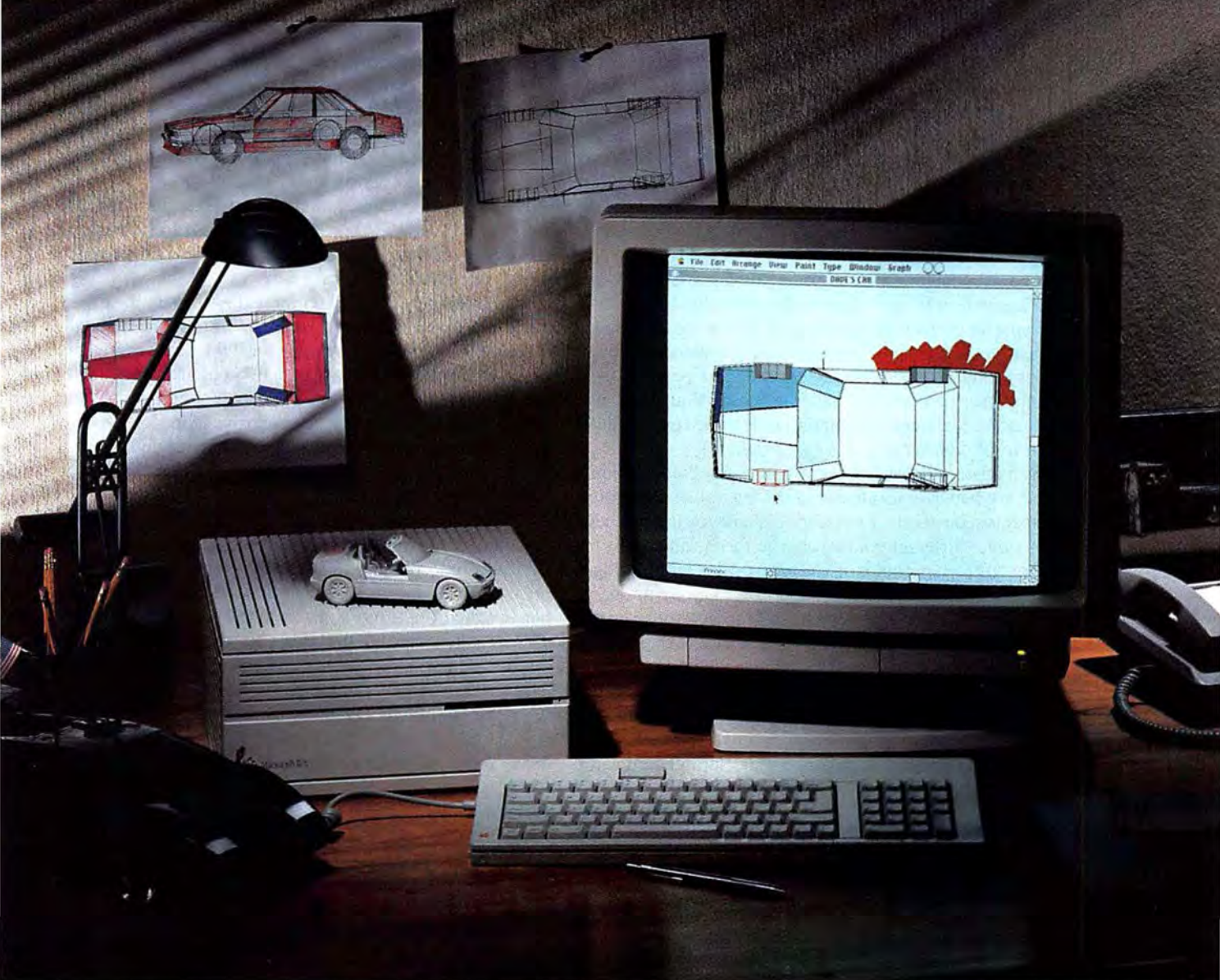
Ready,Set,Go! is a former top-of-the-line product that seems to be losing its momentum, as Letraset concentrates on its Studio line and sleek DTP newcomers steal the limelight. But its style sheets, typographical controls, and ease of use still make it worth at least one last look.

Springboard Publisher II

Springboard Publisher II rounds out the quintet of budget layout programs. It opens to a new, untitled document when launched. Thankfully, all the relevant layout commands are corralled on one menu. However, the program is more like a word processor than a DTP application—for example, to create the page numbers, you specify their position and format in a dialog box.

There are no master pages, so handling repeating graphics took some planning. To work around this, we created a dummy master at the start of the document, with scotch rules at the top and a thin bottom rule. When we needed these rules, we just duplicated the dummy page.

Each page has a background text frame that automatically links to the background frame on the next page. In



Last night, someone stole

Dave's car. And the scary part is, he never even knew it was gone. The same thing can happen to you if you're leaving your Mac unlocked. Co-workers can cruise through your files, causing accidents and leaving viruses. Or thieves can take what they want—and trash the rest. All good reasons to get DiskLock.™

DiskLock doesn't let anyone into your system without your password. It automatically locks your drive when you shut down, and you can set it to lock when

your Mac's been idle for a specified time. Plus, DiskLock lets you choose from three levels of security, including the government standard, DES encryption. That's serious protection.

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automatically checks itself for viruses.

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Page Layout

some cases, we needed a more flexible layout, so we drew out our own frames with the pointer tool and linked them. Linking, like page numbering, takes place in the dark confines of a dialog box. You have to select a frame, access the dialog box, and type in the frame number (Springboard numbers frames as you create them). This awkward implementation of frame linking takes patience. The dialog box did, however, let us insert jump lines. Unfortunately, they don't update automatically.

The screened bios caused some problems. Springboard can't specify a fill for a text frame, so we had to create a transparent graphic frame the same size as the paragraph, import an EPS graphic (actually, just a rectangular black block), and change its gray level to 10 percent — a complicated process, to say the least. You can't use Springboard's integrated painting tools for screens, because their resolution is too coarse (see Figure 7).

Springboard doesn't support spot color, but that didn't mean we had to abandon our blue scotch rules. If colored elements such as rules form distinct shapes on the page and don't touch different-colored objects, there's absolutely no reason to drop spot color. If you are working within budget constraints, then it's cheaper and faster simply to take a laser proof to the lino printer with indications written on the proof of what colors the rules or objects should be. Printing separate spot-color plates is expensive and unnecessary.

Springboard imports the standard word-processing formats, and it also has a typing window, which is similar to PageMaker's Story Editor. There are no style sheets, so we used the library-page technique again. Springboard can't


color text, but the SmartArt DA, a PostScript graphics-effects package, is included with the program, so we used it several times for gray text (you need a PostScript printer to print it out). The old Option-spacing trick worked just fine for force-justifying headers, and we used the program's character-spacing controls to kern headlines.

We created the subscription form outside the program and imported it as EPS, because Springboard doesn't rotate text. We created drop caps in separate frames and dropped them in as with the other programs.

Springboard can't handle color text — its painting tools are in black-and-white — so we had to redo the colored PICT Excel chart. We converted the TIFF scanned image to MacPaint in Adobe Photoshop. EPS posed no problems.

Springboard Publisher II is a decent program. It doesn't exactly shine, but it's the least expensive of the lot. If your needs are very, very modest, it's not a terrible choice.

The Bottom Line

Of these five programs, Publish-It! Easy and Personal Press are the obvious first choices for anyone needing to do DTP on a budget. They offer the most features at reasonable prices. Publish-It! Easy is easier to use than Personal Press, but Personal Press has some unique and useful features such as AutoCreate. Of the others, Ready,Set,Go! is easily the best of the bunch. Springboard Publisher is only for those with extremely limited needs, and RagTime Classic is a reminder of why DTP was scorned years ago. 

Gregory Wasson is a *MacUser* contributing editor and free-lance typesetter.

Table 1: Features of Budget Page-Layout Programs

	Personal Press 1.0 ★★★★½	Publish-It! Easy 2.01 ★★★★½	RagTime Classic 2.1 ★★	Ready,Set,Go! 4.5 ★★★	Springboard Publisher II 2.0 ★★
List price	\$299	\$249.95	\$195	\$295	\$199.95
Pros	Style-sheet support. AutoCreate. Good TIFF-half-tone controls. Spot-color cutouts.	Small disk-space requirements. Five levels of Undo. Vertical justification. Updating jump lines.	Includes spreadsheet module. Control over TIFF half-tones.	Half-tone control. Style sheets. Glossary. Pages can be rearranged in thumbnail view. Pantone support. Vertical justification.	Typing window for quick text entry. Extensive painting tools. SmartArt DA included.
Cons	Memory and disk-space hog. Editing in 100% view only. Occasional slow screen refresh. Only one document open at a time.	100-page document restriction. Absence of real style sheets.	Copy-protected. No layout rulers. Poor documentation. Modal operation. Imports only Word 1.0, MacWrite 5.0, and ASCII files. No style sheets.	Limited graphic tools.	No TIFF-half-tone support. No spot color. Clumsy text-frame linking. No master pages. Text editing and graphic creation in 100% view only.
Company	Silicon Beach Software, Inc. P.O. Box 261430 San Diego, CA 92126 (619) 695-6956	Timeworks, Inc. 444 Lake Cook Rd. Deerfield, IL 60015 (800) 535-9497 (708) 948-9200	RagTime USA 400 Walnut St. Ste. 501 Redwood City, CA 94063 (415) 780-1800	Letraset 40 Eisenhower Dr. Paramus, NJ 07653 (201) 845-6100	Spinnaker Software 201 Broadway Cambridge, MA 02139 (617) 494-1200

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*Not compatible with Macintosh 128K or 512K machines.



Publish It! Easy 2.0 packs an incredible amount of power into one economical package. ■ Its combination of word-processing, graphics, and page-layout capabilities works — speedily — on **any Mac** (no hard-disk drive required). ■ **Publish It!** Easy offers more basic features than Pagemaker 4.0 — for example, vertical justification and incremental rotation of text and graphics — plus innovative features such as an interactive command palette; a service-bureau checklist; and the Slide-show, which may eliminate the need for a separate presentation.

■ This Timeworks offering is an excellent choice for owners of low-end Macs or anyone else who doesn't need fancy color features — or the price tags with them.

— MacUser —

Location
Lincoln Center
935 Maple Avenue

Application

MacWrite II

FileMaker Pro

MacDraw II

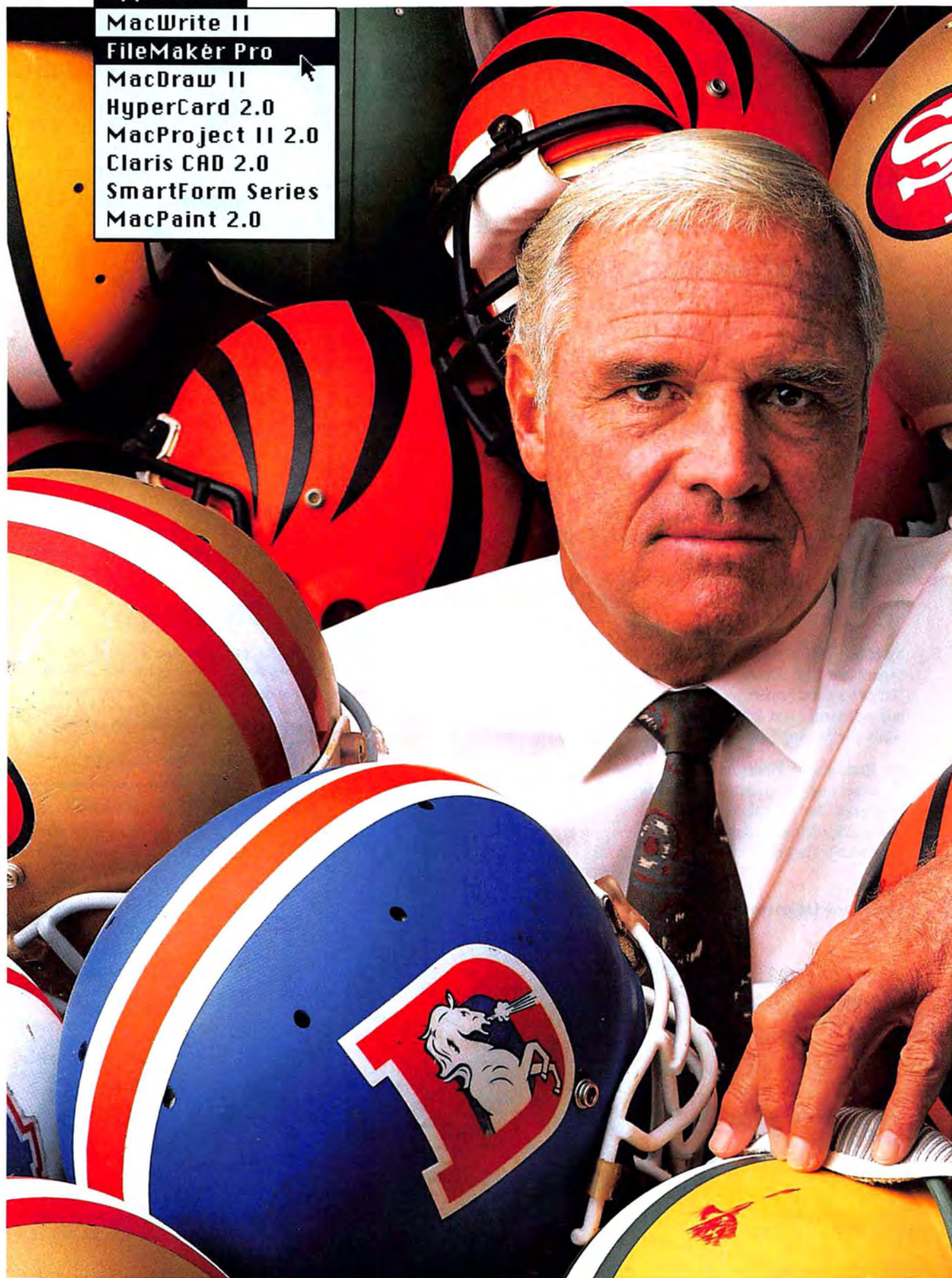
HyperCard 2.0

MacProject II 2.0

Claris CAD 2.0

• **SmartForm Series**

MacPaint 2.0



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THE MAC/TV CONNECTION:

Video is changing the way we use Macs. Camcorders are replacing scanners, and live video from VCRs and videodisc players is giving motion to business presentations. MacUser Labs tests seven ways to add multimedia muscle to your Mac.

●
BY
PAUL YI
AND THE
MACUSER LABS
STAFF

Desktop Video

Imagine using your Mac to manipulate video images — that's right, *television* — as easily as you now write a memo, crunch numbers with your favorite spreadsheet program, create full-color images, or record and edit sound or music. Well, you can't. Not yet, at least. The perfect Mac/TV connection is not as far in the future as you might think, though. The multimedia revolution has already provided products that let you show live full-motion video in a Mac window or digitize single or multiple images from any video source and then save and manipulate them as you would any graphics file. With products available today, any member of the Mac II family can play video in a resizable window, which makes it possible to overlay Mac text and graphics or create special effects that enliven the duller quarterly sales projection.



Figure 1: Making the Connection

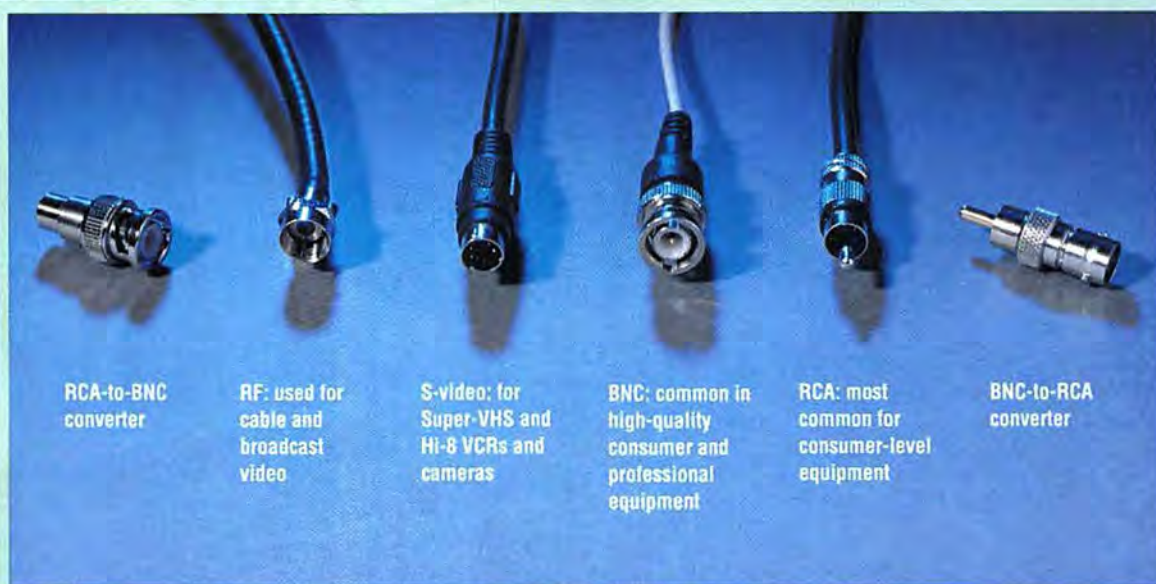


Figure 1: Making the right video connections is like solving a jigsaw puzzle: Once you have all the right pieces, everything should fit.

Single-frame video digitizers can provide instant color photos for desktop publishers armed with camcorders or still-video cameras. The image quality may not be as good as that of high-quality scans of traditional photographs, but the time you save by not having to wait for photo processing, printing, and scanning can prove invaluable when you're on a tight deadline. Multiple-frame video digitizers can provide brief full-motion video animations playable by HyperCard, MacroMind Director, Authorware, and other popular multimedia and animation applications.

Versatile Video

This month MacUser Labs takes a first look at these emerging video tools. For this report, we tested and evaluated seven products that put TV images onto your Mac's screen and that capture 16- and/or 24-bit-color video images. All the products in this report are NuBus cards. Two have external boxes attached, two also provide standard Mac video, and the rest work with third-party Mac video cards.

The Computer Friends ColorSnap

32+, Mass Microsystems QuickImage 24, and Neotech Image Grabber are strictly video digitizers—they let you take digital "snapshots" of any video image, whether it be from a video camera, a VCR, or a videodisc player. The E-Machines QuickView, RadiusTV, RasterOps ColorBoard 364, and VideoLogic DVA-4000 can also convert television signals into full-motion video that can be played on your Mac screen—as long as your Mac is connected to a video source. The RasterOps ColorBoard 364 and the E-Machines QuickView go one step further by being able to digitize brief sequences of true digital video.

The three digitizing-only cards can preview live or taped video in a small window—although at an fps (frames per second) rate slower than the 30 fps needed for true full-motion video. The Neotech Image Grabber is a NuBus card that previews video only in gray scale, but you can use it to capture still video in color if you use the external Colour Adaptor Module, which connects to the Image Grabber card.

The more powerful products cost two to three times as much as the

budget ColorSnap 32+ and QuickImage 24—but they also accomplish two to three times as much. For example, the RadiusTV, a combination NuBus card and external box, is not just a capture/display product—it also includes a full-function television tuner with audio, and it can read and capture closed-captioned text.

The RasterOps ColorBoard 364 and the E-Machines QuickView both capture single or multiple frames of video, and the ColorBoard 364 also functions as a 24-bit-color video card. The QuickView provides only 16-bit color—and it costs more than twice as much as the ColorBoard 364. The VideoLogic DVA-4000 is an impressive two-card configuration targeted at the multimedia market. The DVA-4000's sophisticated software can overlay Mac graphics onto video and can control stereo audio input.

The products we discuss in this month's roundup put TV images onto a Mac screen. In an upcoming issue, we'll review six products that put Macintosh screen images onto TV or videotape. The TV Board and the TV Box, from Generation Systems, and

the RasterOps Video Expander are external boxes and NuBus cards that convert Mac video images into TV ones; the Mass Microsystems ColorSpace Ili/FX, the RasterOps ProVideo 32, and the Truevision NuVista+ are NuBus cards that can manipulate live video and combine it with Mac graphics. Like this month's products, the Mass Microsystems ColorSpace Ili/FX and Truevision NuVista+ can capture frames — but we're saving them for an upcoming report, because their true power lies in putting Macintosh images onto videotape with overlays and other video effects.

What's in a Board?

To help you decide which desktop-video product is right for you, we first played the role of users to see how easy the cards are to set up and use. We

quickly discovered that although you don't have to be a video engineer to use them, they aren't as easy to use as most other Mac products are. We then tested each card's video-capture abilities by digitizing two industry-standard test signals and analyzing the results.

To analyze desktop-video performance, it's important to know the difference between *Mac video* and *television video*. Television video is an interlaced 525-line, 30-fps signal called NTSC video (see the "How It Works: Mac Video Versus TV Video" sidebar). NTSC is the U.S. standard for television broadcast and playback and is the signal broadcast over the air and sent via cable and what comes out of a VCR, videodisc, or video camera. The Mac, however, works with a non-interlaced video signal that shows video at 67 to 82 fps.

The first step in getting video on-screen or onto your hard disk is to convert the incoming NTSC signal into a Mac video signal. This is called *decoding* the NTSC signal. As it enters the Mac, the signal is still *analog* — that is, it carries information by making changes in its waveform — and not *digital*. Digital signals — used to carry and manipulate information in all computers — are based on patterns of 1s and 0s, or ons and offs. If a frame of video is to be saved to your hard disk, the analog signal must be converted to a file that comprises digital signals. This analog-to-digital, or A/D, conversion happens on the video-in card as you save video frames to your hard disk in PICT or TIFF formats.

The desktop-video products that rely on third-party Mac display cards to show live video in a Mac window —

How It Works: Mac Video Versus TV Video

You can't plug your TV in to a Mac display card. To translate electrical signals into pictures on its screen, your television uses a video format, or set of rules, called *NTSC video*. Your Mac, on the other hand, uses a radically different format, usually referred to as *Mac video*.



Mac video

Noninterlaced, 640 x 480, 67 Hz

Mac video draws an image by using a *progressive* or *noninterlaced* scanning method. The video image is drawn line by line.

Mac video uses *vertical-scan frequencies* of 67 Hz (hertz, or times per second) to 82 Hz — the screen is redrawn 67 to 82 times a second. With this high *refresh rate* of 67 to 82 frames per second, Mac screen images look crisp and text does not flicker.



NTSC video

Interlaced, 640 x 480, 30 Hz

NTSC video uses an *interlaced* scanning method. The video image is painted first by every odd line and then by every even line; together the two sets of lines make up a single frame of NTSC video.

The NTSC *vertical-scan frequency* — how fast it paints each picture on the screen — is 30 Hz for each frame. A refresh rate of 30 frames per second is adequate for color images, but fine lines and text are fuzzy and flicker is pronounced.



Figure 2: Computer Friends includes useful image-cataloging software with its ColorSnap 32+ video-digitizing board. The Gallery function stores multiple "galleries" of images, even in compressed form, with thumbnail views of each image in a gallery.



Figure 3: The E-Machines QuickView board can digitize multiple frames of video and save them in PICS format — a series of PICT files linked to make a short video animation. The software's excellent interface includes thumbnail views of each frame.

On the Horizon

The source for live video today is an analog signal, but the future is all digital. You will soon be able to store full-motion video images on your hard disk and play them from it rather than from your VCR. Digital-video images will be as easily accessible and manipulable as text files — you'll be able to move them and place them in other documents.

You can easily digitize single frames of video with all the products we looked at for this report. Some can also digitize multiple frames but not quickly enough to record full-motion video. It's just as well, though: A single frame of 24-bit video at 640-x-480-pixel resolution needs almost 1 megabyte of storage space. If a board were able to digitize at 30 fps (frames per second) — and if the Mac's SCSI port could keep up — you'd need a 300-megabyte hard disk to store just 10 seconds of digital video!

The answer to the storage dilemma is compression. Tomorrow's digital-video products will offer real-time, *on-the-fly* compression with factors of 50:1 to 200:1. Color-prepress applications already use JPEG (Joint Photographic Expert Group) compression to get high-quality compression in the neighborhood of 50:1 for still images. JPEG is an industry standard for still-image compression that's beginning to make its way into full-motion video.

Besides JPEG there's MPEG (Moving Pictures Experts Group), which has a digital-video- and digital-audio-compression standard. MPEG compression compresses similar frames of video, keeping track of elements that change between frames and discarding redundant information. The resulting compression allows full-motion video to be sent at CD-ROM data rates — around 160K per second.

Products are already on the way that will bring long-playing full-motion digital video to your desktop. SuperMac plans a line of products from high to low end that should be available by the third or fourth quarter of this year. At the high end — around \$5,000 — is a Mac display card that can digitize video with real-time JPEG compression and decompression, digitize audio, and output both to videotape.

SuperMac will also be offering a low-end video and audio digitizer for less than \$1,000. Unlike its more powerful sibling, the low-cost hardware/software product will provide digital video slower than full-motion speed and smaller than full-screen. SuperMac Technology, 485 Potrero Avenue, Sunnyvale, CA 94086; (408) 245-2202.

A small Boston-area company called DiVA, formed by some MIT Media Lab graduates, is also planning low-end digital-video and digital-audio software currently code-named Chaplin. The company promises that Chaplin will easily and powerfully digitize video from a camcorder or VCR and will work with a variety of compression boards. Its software offers a new file format called *Micon* — short for "movie icon" — that shows a preview version of the digitized-video image at the size of a normal Mac icon. Like any other icon, a Micon can be moved, copied, and pasted. The difference is that the Micon shows an 8-bit movie representation of the digitized-video file. A combined software and hardware product will retail for around \$1,000. DiVA (Digital Video Applications), 222 Third Street, Suite 3332, Cambridge, MA 02142; (617) 491-4147.

Another Cambridge company, VideoLogic, has a video-compression card in the works, although it still hasn't decided whether to go with a stand-alone board or integrate compression with its current DVA-4000 product. VideoLogic, Inc., 245 First Street, Cambridge, MA 07142; (617) 494-0530.

Another piece of the digital-video pie — QuickTime, a multimedia coordinator that will be part of the Mac's operating system — will soon arrive from Apple. QuickTime will define digital-video and digital-audio formats and will allow digital animations to play at the same speed, no matter the Mac platform. Without such a controller, a MacroMind Director animation, for example, runs faster on a Mac IIx than on a Mac IIcx, because of the IIx's faster processing speed. QuickTime will go a long way toward making multimedia more consistent and predictable — good news for developers and users. Apple Computer, Inc., 20525 Mariani Avenue, Cupertino, CA 95014; (408) 996-1010.



Figure 4: The RadiusTV ushers in a new era of broadcast television, right on your Mac desktop. You can switch between broadcast and cable channels, lower the volume, and even read and capture closed-captioned text.

the Computer Friends ColorSnap 32+, E-Machines QuickView, Mass Microsystems QuickImage 24, Neotech Frame Grabber/Colour Adaptor Module, and RadiusTV—all work with a range of Mac video cards and monitors (see Table 1). However, the speed at which decoded RGB video passes to the resident video card is limited by the Mac's NuBus and the response time of the resident video card.

A single frame of a 24-bit full-resolution (640 x 480 pixels) video image is a whopping 1 megabyte. So sending 24-bit video at 30 fps (full-motion) from a digitizing card to a Mac display card requires data-transfer rates of around 30 megabytes per second. Although in theory the NuBus can move data at this speed—using a special transfer mode called block-mode transfer—we've never seen the Mac's NuBus transfer data as fast as this in real-world applications. The best any card can accomplish with 24-bit color is to display video images at a quarter of full size and at 15 fps. This small and slow preview is enough for digitizing, however, because you don't need to view each frame to capture a single video image.

Full-motion video is possible if you set your Mac monitor to 8 bits, or 256

colors. This setting significantly reduces the amount of information sent over the NuBus but gives you a disappointing video image compared with the original. A minimum of 16 bits is required for color that approximates what you expect a television picture to look like.

The E-Machines QuickView and the RadiusTV provide full-motion video by passing 8 or 16 bits of converted video over the NuBus to the third-party display card. If the display card has a 24-bit display mode but no 16-bit mode, the QuickView and the RadiusTV can display video only in 8-bit color. The RadiusTV has no problem showing full-motion video in 16-bit color, but the E-Machines QuickView manages a full-sized 16-bit screen only at 15 fps.

The RasterOps ColorBoard 364 and VideoLogic DVA-4000 aren't constrained by the need to pass converted video over the NuBus—each acts as a Mac display card as well as a digitizer. The ColorBoard 364 has digitizing and display circuitry on a single card—it merely passes the decoded NTSC video from one part of the card to another, providing an Apple 13-inch RGB monitor with a full 24 bits of color. Physically, the ColorBoard 364 looks like any other Mac display card,



Figure 5: The VideoLogic DVA-4000 comes with a powerful HyperCard stack, MIC Producer, that automates script creation for the leading multimedia programs: HyperCard, Macromind Director, and Authorware Professional.

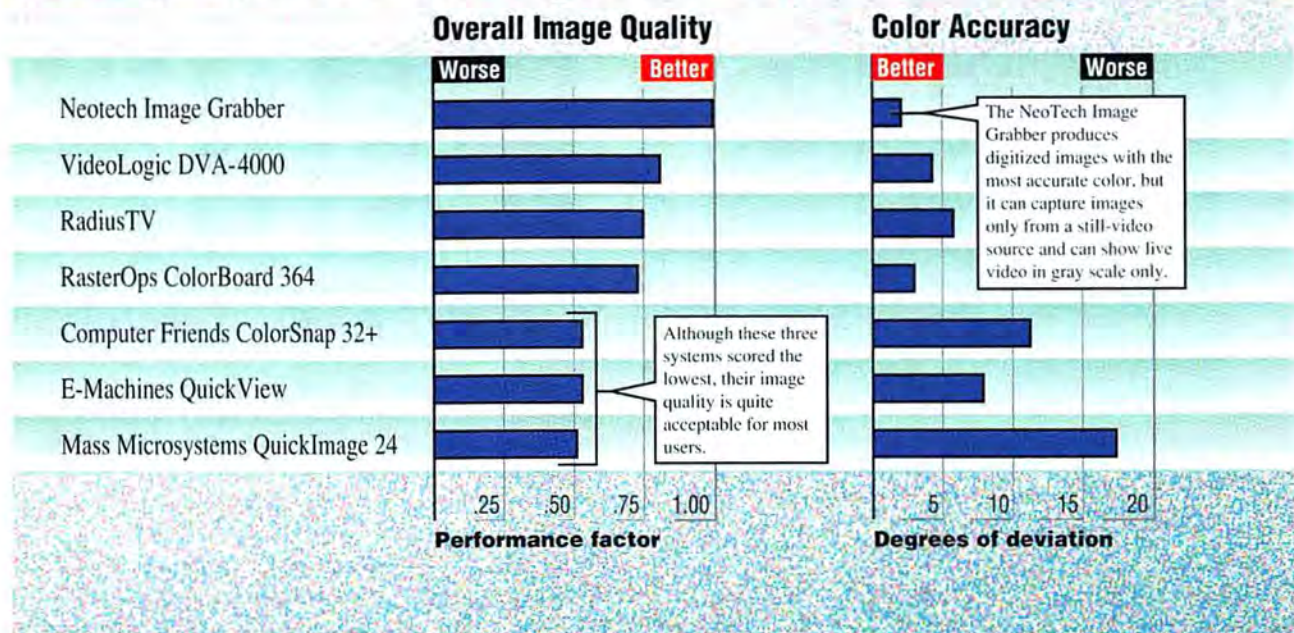
except that in addition to a 15-pin connector for the Apple monitor, it includes two video-input connectors: a composite-RCA-video connector—the most common type of video connector for camcorders and VCRs—and an S-video connector—an input for the high-quality transmission scheme used in Super-VHS and Hi-8 tape decks and cameras.

The VideoLogic DVA-4000 comprises two cards—make sure you have two free adjacent NuBus slots. One card serves as the Mac's RGB display card, driving the Apple 13-inch monitor, and the other serves as the encoder/digitizing card. The digitizing card passes the encoded video over a special cable that connects the two cards, thus avoiding NuBus limitations and enabling video to be shown in 24-bit color and Mac graphics in 8-bit color.

A Plug for Video

Installation of the cards in any member of the Mac II family is as straightforward as installing any other NuBus card. Getting everything else—external boxes and video devices—connected and working is another matter, however. Each card has its idiosyncrasies. Part of the RadiusTV package, for example, is an external

Figure 6: Digitizing and Display Quality



box that connects to its NuBus card via two special cables. The Neotech Colour Adaptor Module has a cable that connects to the Neotech Image Grabber and one that attaches to the ADB port.

If your video experience is limited to connecting your VCR to your TV, the myriad of possible connections involved in the installation of any of these products may be confusing (see Figure 1). You'll find a variety of video connections and cables — RCAs, BNCs, RGBs — and you'll need to learn about them all when you use any of the video products.

Manuals can help in this process, and the nod goes to VideoLogic for a manual that has the clearest instructions of any of the products, complete with diagrams of configurations and answers to any questions you may have — especially impressive because the DVA-4000 is the most complicated product to install. We especially appreciated that the cables are labeled "top" and "to Apple monitor"; no other vendor labeled its cables. The Apple-monitor connection requires the use of a small screwdriver—you can't tighten the screws by hand as you can with

most Mac video cables — but this is the only quibble we had about the DVA-4000's installation.

A HyperCard stack, *The VideoLogic Guide to Multimedia*, gives an overview of video formats and devices and a rundown on authoring and video-controlling software. Other companies — even those with products that are relatively easy to set up and use — should take note of VideoLogic's excellent package. With multimedia and video still misunderstood by a lot of potential users, education is important and may even end up sealing the buying decision.

One Step at a Time

All the desktop-video products we looked at come with at least one application that displays live video on your Mac screen and digitizes single or multiple frames of video into memory or onto your hard disk. The E-Machines QuickView, Mass Microsystems QuickImage 24, RadiusTV, and VideoLogic DVA-4000 have startup software that gives you control of the active video inputs; hue, saturation, and brightness levels; and product-

specific features such as audio levels — just drag the INITs and cdevs into your Mac's System Folder. The RadiusTV and the RasterOps ColorBoard 364 also provide DAs that give you access to the video hardware while you're working in another application — a boon for graphic artists and multimedia developers.

For desktop publishers, the most useful piece of software is a *plug-in*, an add-on utility for an image-manipulation or page-layout program. The appropriate plug-in can, for example, give you access to the digitizing card directly from Photoshop. The convenience of using an already popular program makes a video digitizer as easy to use as a color scanner. The Neotech Image Grabber has plug-ins for Adobe Photoshop, Letraset's ImageStudio, and Silicon Beach's Digital Darkroom. The Computer Friends ColorSnap 32+ has plug-ins for QuarkXPress — called Xtensions — and for Photoshop. After our testing, Mass Microsystems announced a Photoshop plug-in.

The Computer Friends ColorSnap 32+ includes the best software for

Lack of Noise

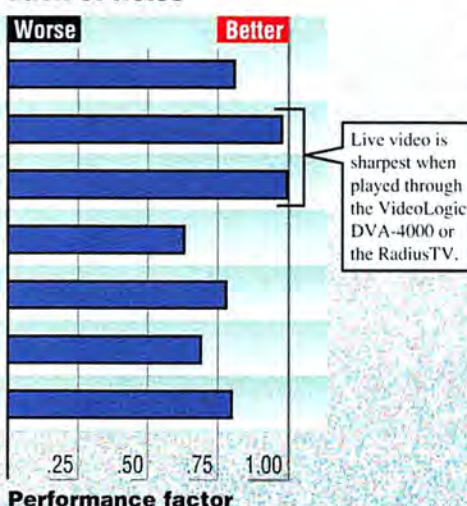


Figure 6: We tested two aspects of the video-digitizing and -display boards' image quality: color and noise. We used the products to digitize an industry-standard color pattern — SMPTE color bars — and a 50-percent-gray signal called a *pedestal*. The signal generator we used provided a clean signal; any color errors or noise were introduced by the video-in products — the quality of your own digitizing will depend on the quality of the video source you use.

Overall Image Quality:

The overall ranking shows the result of combining the results of the color-accuracy and noise tests. The Neotech Image Grabber produced the overall best images — although its live video is limited to 8-bit gray scale. We ranked all the other products by how they performed relative to the Image Grabber.

Color Accuracy:

We measured color accuracy by degrees of deviation from the original color in the 360-degree color wheel, familiar from the Apple Color Picker. The Neotech Image Grabber with its optional Colour Adaptor Module showed the least color deviation from the original colors, whereas the Mass Microsystems QuickImage 24 was noticeably inaccurate.

Lack of Noise:

Signal noise causes digitized images and live video to have *artifacts* — deviations that show up as spots or blurs — that aren't in the original TV image. The RadiusTV and the VideoLogic DVA-4000 produced the most-noise-free images, although all the products performed well. All the other products' performance is shown relative to that of the RadiusTV.

single-frame capture. Besides coming with plug-ins, the ColorSnap 32+ has an easy-to-use image-capture application, ColorSnap-32, that includes a powerful image-cataloging system called Gallery (see Figure 2). The software shows a thumbnail of all the stored images in a "gallery"; you can also have multiple galleries.

The ColorSnap 32+ is also the only product to offer compression of any sort. Its algorithm, similar to the JPEG (Joint Photographic Expert Group) still-image-compression standard, can compress single as well as multiple images. You can save a compressed image by itself or into a gallery. The Gallery function creates a thumbnail view and automatically decompresses and re-creates the full image when you double-click on the thumbnail. There are several image-cataloging programs on the market, but they cost close to half the price of the ColorSnap 32+ alone and don't work seamlessly with the capture card.

Less useful but more powerful software is included with the Neotech Image Grabber, which is designed for use with still-video cameras from

Canon and Sony. The Image Grabber card itself digitizes 8-bit gray-scale video, and the Colour Adaptor Module external box adds color capability. The module accepts inputs from composite, RGB, and S-video connectors and passes 24-bit-color video in three stages: red, green, and then blue, each color using 8 bits' worth of information per pixel. The Image Grabber is limited to still-video images, because the Colour Adaptor Module can digitize only one color channel at a time.

Because of this "three pass" operation, digitizing with the Image Grabber takes longer than with any of the other products. Although the software gives powerful color- and image-analysis and -editing tools, only the most sophisticated and experienced users will be able to take advantage of all of its power. Neotech should work on adding a more user-friendly interface to the rich set of technical controls it currently offers.

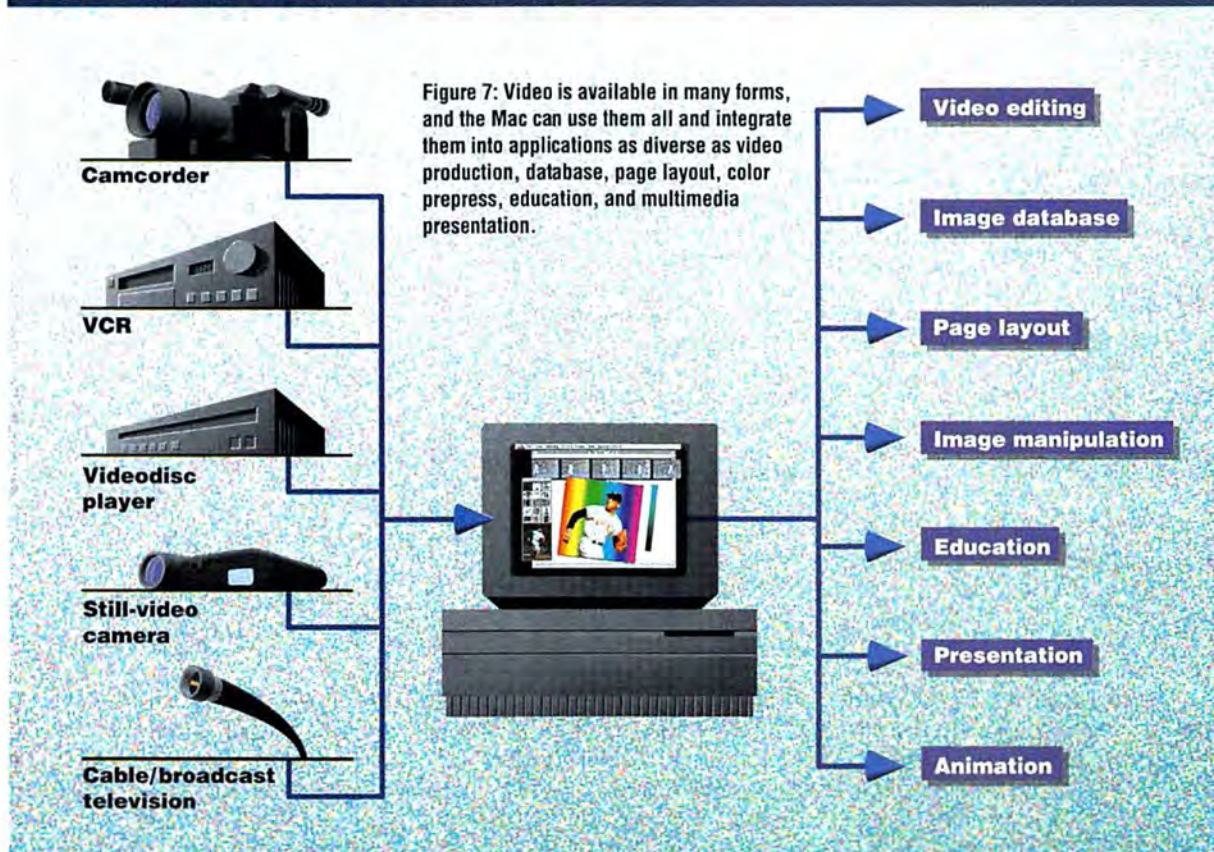
Mass Microsystems provides easy-to-use software called QuickImage that includes a variety of effects filters. After digitizing an image, you can

manipulate it in various ways, including posterizing and blurring. Although we welcome the promised Photoshop plug-in, QuickImage would benefit from more plug-ins and an image-cataloging system.

The Future's Not Here Yet

Although the hardware of all seven desktop-video products is capable of capturing multiple sequential frames, only the RasterOps ColorBoard 364 and the E-Machines QuickView provide the necessary software (although Mass Microsystems should join them by the time you read this report). But don't expect these products to replace your VCR — long-playing full-motion digital video is still a gleam in some developer's eye.

Of the two multiple-frame grabbers, the E-Machines QuickView has the more powerful features: Sequences can be saved either as individual PICT files or in PICS format — an animation scheme that involves a series of linked PICT files. However, our testing showed that neither card is fast enough to capture every consecutive video frame, despite such claims in the

Figure 7: Using the Mac/TV Connection

QuickView manual and software.

The ColorBoard 364 can capture multiple frames to RAM or to your hard disk. When capturing to RAM, the ColorBoard 364 can grab every sixth frame; a hard disk limits the rate to one capture every five seconds. The speed advantage of RAM-based capture seems obvious — until you learn that one 24-bit, full-resolution video image (640 x 480 pixels) fills nearly an entire megabyte of RAM. So if you have 5 megabytes of RAM in your Mac, you can capture a grand total of only five frames! This is just a tiny taste of true digital video — and a major reason why we say that the future's not here yet. Not long from now, however, emerging technology that can compress video 50:1 to 200:1 will let you play full-motion video from your hard disk, a magneto-optical disc, or even a sluggish CD-ROM (see

the "On the Horizon" sidebar).

Using the software included with the E-Machines QuickView, you can vary the size of a digitized image from a full 640 x 480 pixels to a small icon-sized window. At full size, the QuickView captures every fourth frame, and it gets every other frame at quarter size and smaller. You cannot capture to disk, however, so your video sequence is limited by the amount of available RAM. Because small images take up less memory, a 5-megabyte Mac can capture up to 30 quarter-screen frames — two seconds of video at 15 fps, a playback rate that produces acceptable, if slightly jumpy, images. These "video animations" in PICS format can be used in HyperCard, MacroMind Director, or other programs that support PICS. The QuickView software also shows a thumbnail representation of each

digitized frame, and you can capture a sequence with a tumble or zoom effect (see Figure 3).

The first version of the QuickView software — even though it was a full shipping version — frequently crashed our Mac IIx. And the new software we received after our testing was completed still had menu items that, when selected, responded with an alert box informing us that our choice was "not yet supported by this version." E-Machines assures us that by the time you read this, the QuickView software will be complete and will support all menus. The company also plans to add such features as audio support.

Although the software that comes with the RadiusTV doesn't offer sequential captures, it has one important unique feature: a built-in television tuner, so you can view broadcast television on your Macintosh. Radius'

Theatrics software and the RadiusTV DA provide familiar TV controls, including a channel selector and a volume control (see Figure 4). You can switch among broadcast- and cable-television reception and two composite-video inputs.

The RadiusTV also accepts audio from broadcast TVs, VCRs, and videodisc players. Monophonic digitized audio is sent over the NuBus along with the converted video and played through the Mac's internal speakers. The data-transfer limitations of the NuBus, however, can cause the audio to break up and be out of sync with the video, so that sounds — especially dialogue — are sometimes unintelligible. Radius should provide audio outputs on the external box that would let you pump the audio to external speakers.

For multimedia users, VideoLogic ships the most impressive array of software with its DVA-4000 card. Besides the already mentioned Guide to Multimedia instructional HyperCard stack, it supplies two applications that control video input and capture. The DVA-4000's real power, however, lies in its MIC Producer software, which

uses HyperCard 1.2.5 or 2.0 to run (see Figure 5). MIC Producer creates automatic scripts for controlling how video and audio are handled; these scripts can then be output in HyperCard, MacroMind Director, or Authorware Professional format. The DVA-4000 can mix graphics and live video and create video overlays and audio fades — all in a Mac window — and export the routine to one of the three multimedia packages it supports.

The E-Machines QuickView card can also do overlays, but its software limits you to a live-video window. You can't automate or integrate the overlay with a scripted presentation.

Video Tests

In addition to having a broad range of capabilities and features, these desktop-video cards also vary greatly in the quality of the images they provide. To obtain an objective assessment of signal quality, we used a piece of industry-standard test equipment called the Magni 1515 Signal Generator to test the cards' NTSC-signal-decoding quality and their A/D-conversion fidelity.

The first test image was the set of

SMPTE color bars that television engineers and camera operators use to tune the colors on TV sets (see Figure 6). We then used Photoshop's analysis tools to compare the digitized-video file with an ideal set of bars, thus determining how much the colors had been shifted by the digitizing card. The second test file was a 50-percent-gray signal — called a *pedestal* — to see how much noise the analog components of the video cards introduced into the signal.

The products were all fairly accurate in maintaining the true colors of the SMPTE color bars, although the Neotech Image Grabber with the Colour Adaptor Module and the RasterOps ColorBoard 364 stood out as most true to the SMPTE standard. As for noise, the RadiusTV and the VideoLogic DVA-4000 were the cleanest, and the RasterOps ColorBoard was the noisiest — but overall the quality of all the digitized images was acceptable.

When you're choosing and using a board, however, remember that we used a sophisticated signal generator to provide each board with a clean test signal of far better quality than that

Table 1 Criteria

List price — The list price is the vendor's suggested retail price.

Street price — The street price is a typical actual price charged by dealers or mail-order companies during April 1991.

Hardware configuration — The video products come as single NuBus cards, two NuBus cards, or a NuBus card and an external box.

Cables — Does the vendor provide cables for hooking up external boxes and video sources such as VCRs, camcorders, or videodisc players?

NTSC-video input — A list of the types of NTSC connections.

Live-video window (no. of bits) — Some of the products show 24-bit true-color video, whereas the most bits the others can show is 16.

Live-video resolution (pixels) — Some of the products are unable to show the full 640

x 480 resolution of the NTSC signal.

Mac-display-card support — The types of Mac display cards supported. The products that also double as display cards can show live video only on their own display.

Video digitizing (no. of bits; resolution) — A list of digitizing options in pixel depth and resolution.

File-save formats — After digitizing, you can save in PICT and other Mac color-image formats.

Multiple-frame digitizing — Can the product digitize multiple frames of live video, producing short video animations?

Image effects — Does the product offer special manipulation effects similar to those in Adobe Photoshop?

Mac-monitor support — Does the product also act as a display card for the Apple 13-inch RGB monitor?

Mac RGB output (no. of bits; resolution) —

At what bit depths and resolution does the product support the Apple 13-inch RGB monitor?

HyperCard XMCDs — Does the product offer XMCDs — external hooks that let you control the hardware from HyperCard?

MacroMind Director XOBJs — Does the product offer XOBJs — external hooks that let you control the hardware from MacroMind Director?

Other external hooks — Any other hooks to multimedia applications are listed here.

INITs and cdevs — Any startup software is listed here.

Applications — Bundled programs range from simple digitizing to full-function scripting applications.

Plug-ins — The most convenient way to digitize video is through a plug-in for popular image-manipulation and page-layout programs.

from any consumer-level video source. The quality of the images you capture with these boards depends greatly on the quality of the VCR, camcorder, or still-video camera you use.

The overall image-quality champ was the Neotech Image Grabber with the Colour Adaptor Module. If your work is limited to high-quality image capture from a still-video camera and you feel confident enough to handle its sophisticated software, this is the card for you. As far as the other two capture cards were concerned, the Computer Friends ColorSnap 32+ provided more-accurate colors than did the Mass Microsystems QuickImage 24, and the color fidelity of the QuickImage 24 was the worst of all the products.

The VideoLogic DVA-4000 finished second in overall image quality and tops among full-motion-video cards. The RadiusTV came in third, with the RasterOps card trailing it. The

E-Machines QuickView had the poorest image quality of the full-motion-video cards.

If you plan to use one of these cards to play full-motion video in a multimedia program, we recommend that you choose among the DVA-4000, the RadiusTV, and the RasterOps ColorBoard 364, because they can display full-motion video at 30 fps. The E-Machines QuickView has trouble displaying video at the full 30 fps, even though it sends 16-bit video over the NuBus, as does the RadiusTV.

Mightier Than Hardware

Desktop video has been a hot topic in Mac multimedia for the past few years, but only with the release of these products has it become a data source that can be combined with Mac graphics and animation to create a fully integrated single-monitor multimedia presentation. Desktop publishers and

image-database programmers can create instant full-color images by pointing a video camera and clicking a mouse, thanks to convenient plug-ins for popular image-manipulation applications such as Photoshop.

Although all the products' hardware performed flawlessly, the paucity of competent software heavily influenced our recommendations (see the "Bottom Line" sidebar). No vendor yet provides complete and powerful software that would make integration of video images into multimedia applications simple and easy. However, the glimpses of such power we saw in some of the products are tantalizing evidence that desktop video is well on its way to joining the next wave of the communications revolution.

Paul Yi is a MacUser associate editor. He would like to acknowledge the invaluable assistance of Pete Nehl in research and testing for this report.

The Bottom Line

Desktop video is rapidly making the transition from hype to reality — although long-playing, full-motion video stored on and played from a hard disk is still over the horizon. However, integrating full-motion video into multimedia presentations from a camcorder, VCR, or videodisc player is becoming increasingly easier and the quality is also improving. In addition, capturing single-frame video images is now an inexpensive and quick alternative to using a color scanner.

For graphics users who want to digitize single frames of video, we recommend the **Computer Friends ColorSnap 32+** (\$995). Although its image quality may not be the best, it is more than adequate for most uses. What really impressed us was the ColorSnap 32+'s ease of use and powerful and complete software — including image cataloging and plug-ins for Photoshop and QuarkXPress, with more on the way.

For multimedia use, the nod goes to the **VideoLogic DVA-4000** (\$2,995) — a complete audio/video product for multimedia. The DVA-4000 is the easiest board to integrate into multimedia packages, including HyperCard, MacroMind Director, and Authorware Professional. It produces the clearest video image and the most-accurate colors of all the full-motion boards, but its real power lies in its software. MIC Producer is a great place to start creating your own video presentations, complete with graphics overlays onto live video. The DVA-4000 also has stereo audio that's controllable through software.

Two very strong hardware video products are the **RadiusTV** (\$2,795) and the **RasterOps ColorBoard 364** (\$1,295). The RadiusTV represents the future of computer television, with audio capabilities, the ability to read and capture closed-captioned text, and a tuner that can pick up broadcast and cable television. It provides clear and accurate video images but has little software to take advantage of its

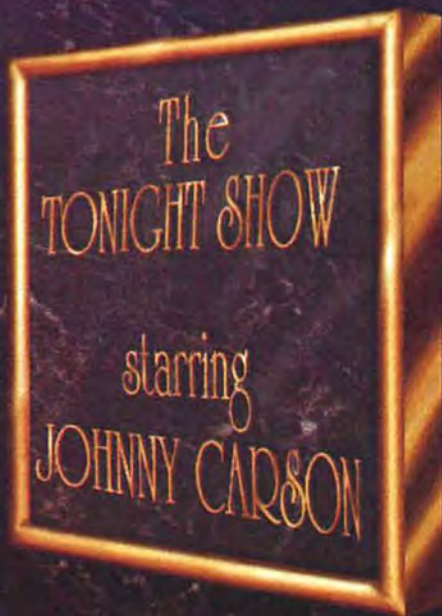
capabilities. Developers will appreciate its power, but prospective purchasers might have a tough time justifying a \$3,000 TV.

The RasterOps ColorBoard 364 is the best buy for hardware features and power. Besides being a digitizing and display board, the ColorBoard 364 is also a 24-bit-display card for the Apple 13-inch monitor — a feature that makes it extremely attractive for new Mac buyers. RasterOps has just introduced a new version of the ColorBoard 364, the 24STV, which should offer even more bang for the buck.



We recommend the **Computer Friends ColorSnap 32+** (bottom left) for capture of single frames of video. The **VideoLogic DVA-4000** (bottom right) is the clear choice for using full-motion video. Two very strong hardware products with limited software are the **RadiusTV** (top left) and the **RasterOps ColorBoard 364** (top right).

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Table 1: Features of Desktop-Video Products

● = yes ○ = no	Computer Friends ColorSnap 32+ \$\$\$½	E-Machines QuickView \$\$\$½	Mass Microsystems QuickImage 24 \$\$\$½	Neotech Image Grabber/ Colour Adaptor Module \$\$\$\$
List price	\$995	\$2,945	\$995	\$1,998*
Street price	\$995	\$2,000	\$800	\$1,998
Pros	Easy to use. Image catalog. Compression. Inexpensive.	Nice software interface for multiple-frame digitizing.	Easy to use. Inexpensive. Effects filters.	High-quality digitizing. Outputs gray-scale NTSC.
Cons	Slow live-video display in a small window.	Expensive. 16-bit live video is slower than 30 fps.	Slow live-video display in a small window.	Only digitizes still video. Live video in gray-scale only.
Hardware configuration	NuBus card	NuBus card	NuBus card	NuBus card + external box
Cables	yes	yes	no	yes
Video in				
NTSC-video input	composite, RGB, S-video	composite, RGB, S-video	composite, S-video	composite, RGB, S-video
Live-video window (no. of bits)	4-, 8-, 24-bit	8-, 16-bit	24-bit	8-bit (gray scale)
Live-video resolution (pixels)	160 x 120, 320 x 240	640 x 480, resizable	320 x 240	640 x 480, resizable
Mac-display-card support	any 8-, 16-, or 24-bit display card	any 8- or 16-bit display card	any 8-, 16-, or 24-bit display card	any 8-, 16-, or 24-bit display card
Video digitizing (no. of bits; resolution)	24-bit; 640 x 480	8-, 16-bit; resizable	24-bit; 320 x 240, 640 x 480	8-, 24-bit; 640 x 480
File-save formats	PICT, TIFF	PICS, PICT	PICT, TIFF	EPS, PICT, TIFF
Multiple-frame digitizing	○	●	●	○
Image effects	○	●	●	●
Mac display				
Mac-monitor support	○	○	○	○
Mac RGB output (no. of bits; resolution)	none	none	none	none
Software				
HyperCard XMCDs	●	○	○	○
MacroMind Director XOBs	○	○	○	○
Other external hooks	none	none	none	none
INITs and cdevs	none	QVS-VideoMgr	QuickImage	none
Applications	ColorSnap-32	QuickView Studio 1.0	QuickImage	Image Grabber
Plug-ins	Photoshop, QuarkXPress	none	Photoshop	Photoshop, ImageStudio, Digital Darkroom
Options	none	QVS Sound, \$395; QuickView Video Encoder, \$575	none	Time Frame Sequencer, \$199
Technical support	unlimited	unlimited (toll-free)	unlimited (toll-free)	unlimited
Warranty	1 year	1 year	1 year	1 year
Company	Computer Friends 14250 N.W. Science Park Dr. Portland, OR 97229 (503) 626-2291	E-Machines 9305 S.W. Gemini Dr. Beaverton, OR 97201 (800) 344-7274 (503) 646-6699	Mass Microsystems 810 W. Maude Ave. Sunnyvale, CA 94086 (800) 522-7979 (408) 522-1200	Advent Computer Products, Inc. 449 Santa Fe Dr., Ste. 213 Encinitas, CA 92024 (619) 942-8456

* The list price is that of the tested version, which included both the Image Grabber (\$1,499) and the optional Colour Adaptor Module (\$499).



24XLTV • 24STV • 8LC DISPLAY SYSTEM • CLEARVUE XL DISPLAY SYSTEM



CLEARVUE CLASSIC DISPLAY SYSTEM • CLEARVUE/GSLC DISPLAY SYSTEM • TV TUNER • VIDEO EXPANDER

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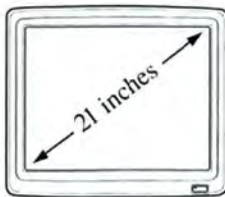
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Table 1: Features of Desktop-Video Products, continued

● = yes ○ = no	Radius RadiusTV ****	RasterOps ColorBoard 364 ****	VideoLogic DVA-4000 ****½
List price	\$2,795	\$1,295	\$2,995
Street price	\$2,095	\$915	\$2,995
Pros	Includes TV tuner. Audio inputs. Captures closed-captioned text.	24-bit Mac display card. Inexpensive.	Good manuals. Powerful software. Stereo audio.
Cons	Limited software. Live video only in 16 bits. Expensive.	Noisy digitizing and display. Limited software.	Expensive. 8-bit Mac display. Monitor cable hard to install.
Hardware configuration	NuBus card + external box	NuBus card	two NuBus cards
Cables	yes	no	yes
Video in			
NTSC-video input	composite, RF, RGB	composite, S-video	composite, RGB, S-video
Live-video window (no. of bits)	8-, 16-bit	24-bit	24-bit
Live-video resolution (pixels)	640 x 480, resizable	640 x 480, resizable	640 x 480, resizable
Mac-display-card support	Radius GS/C, DirectColor Series, Apple display cards	NA	NA
Video digitizing (no. of bits; resolution)	8-, 16-bit; resizable	8-, 24-bit; resizable	8-, 24-bit; resizable
File-save formats	PICT	PICS, PICT, TIFF	PICT
Multiple-frame digitizing	●	●	○
Image effects	●	●	○
Mac display			
Mac-monitor support	○	●	●
Mac RGB output (no. of bits; resolution)	none	1-, 2-, 4-, 8-, 24-bit; 640 x 480	8-bit; 640 x 480
Software			
HyperCard XMCDs	●†	●	●
MacroMind Director XOBJs	●†	●	●
Other external hooks	C, Pascal†	none	Authorware Professional
INITs and cdevs	Radius Grabber	none	MIC System II
Applications	Theatrics, RadiusTV DA	FrameGrabber, 364 Video DA	MIC ToolBox, MIC Videosnap, MIC Producer
Plug-ins	none	none	none
Options	none	none	none
Technical support	unlimited	unlimited	support through dealers
Warranty	1 year	1 year	1 year
Company	Radius 1710 Fortune Dr. San Jose, CA 95131 (408) 434-1010	RasterOps 2500 Walsh Ave. Santa Clara, CA 95051 (408) 562-4200	VideoLogic, Inc. 245 First St. Cambridge, MA 07142 (617) 494-0530

†Optional external hooks are available from Radius, only on request.

Director	GARY MILLER
Producer	GARY MILLER
Editor	GARY MILLER
Writer	GARY MILLER
Musical Score	GARY MILLER
Animation	GARY MILLER
1st Cameraman	GARY MILLER
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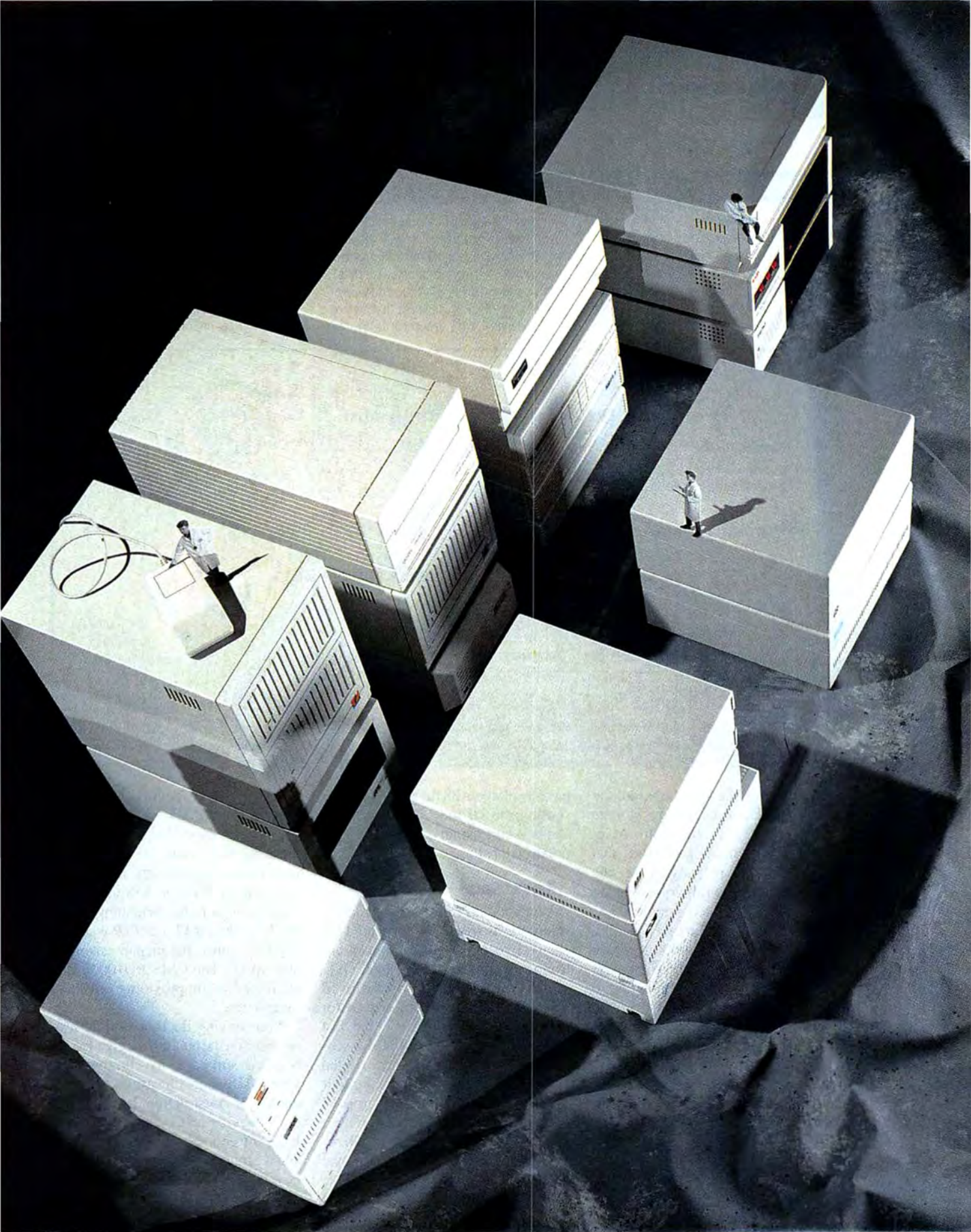
MacUser Labs explores the Land of the Giants! If you've outgrown your current hard drive, a compact high-volume solution might be easier — and cheaper — than you think.

Parkinson's law says that work expands to fill the time available for its completion. True — but incomplete: Work also expands to fill the space available for its storage. There's no such thing as too much room on a hard disk, especially for work that involves graphics or sound. As your files — in ever-greater sizes and numbers — start straining the seams of 150-, 300-, and even 600-megabyte drives, it's time to contemplate the great leap into the gigabyte zone.



BY

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AND THE
MACUSER LABS STAFF**



Partitioning

Disk partitioning has a lot in common with filing your income tax: It's highly recommended, there's more than one way to do it, and some ways are more advantageous than others. Of the three disk-partitioning methods in general use today, two are fraught with serious problems. Fortunately,

none of these problems is as annoying or long-lived as disagreements with the IRS.

Generally, disk partitions fall into two main classes: hard and soft (see Figure A). Hard partitions divide a hard disk into one or more areas (logical volumes) that all look like individual hard drives to the Finder.

Each partition is independent of the others; if a crash destroys one partition's file system, the other partitions on the same disk may well survive intact.

Hard partitions come in two flavors: "old," as described in *Inside Macintosh, Volume IV*, or "new," as described in *Inside*

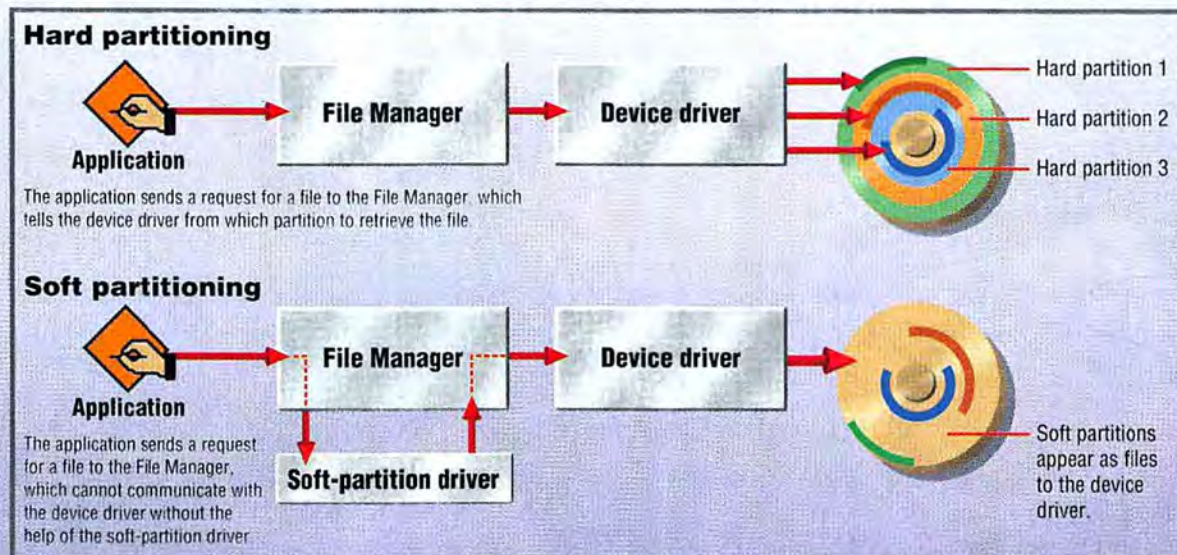


Figure A: Hard partitions are distinct physical blocks of space on a hard disk. Each hard partition contains a complete and independent Mac HFS. Soft partitions function more like files than distinct partitioned areas; they are accessed through the disk's main HFS.

This month MacUser Labs looks at 19 of the highest-capacity storage devices available for your Mac: *gigadrives* — hard-disk drives that can hold 1,000 megabytes, or one *gigabyte*. If you do full-color desktop publishing — in which a single 8.5-x-11-inch 24-bit-color image can fill a 20 megabyte file, a 1,000-megabyte drive will help you pay more attention to your projects and less attention to their management. If you work with enormous databases, a gigadrive will keep you from having to distribute fragments of the master file over several drives. Ditto if you work with laboratory systems that need to capture hundreds of thousands or millions of observations and then make sense of the numbers. Finally, a gigadrive can be a godsend if your office file server is rapidly filling up with information that you absolutely, positively must

have available at all times. With prices starting at less than \$3,000, a gigadrive can be a surprisingly affordable solution to your storage problems.

Beyond Speed

You shouldn't choose a gigadrive solely for its speed and formatted capacity. Except for the standout Wren-Runner 2-equipped MicroNet SBT-1288NP, each of our 19 drives worked about as well as any other. And for good reason: Fourteen use the fast Seagate/Imprimis ST41200NM mechanism (more prosaically known as the Wren 7), whereas the remaining four use the only slightly slower Micropolis 1598-15. Performance differences among identically configured drives are caused by their *drivers* — the software that manages how your Mac reads data from and writes it to the drive.

Although the vendors' representations of their products' formatted capacities are somewhat optimistic, the differences between the implied and actual capacities are slight: Most drives weigh in at between 988 and 1,000 megabytes each after formatting. Again the MicroNet SBT-1288NP is an exception, with 1,266 megabytes of usable space. The CMS PD1000S disappointed us by providing only 886 megabytes.

Your buying decision should also be based on the quality of a gigadrive's bundled software, its compatibility with A/UX and with various Macs, its quality of construction, and the vendor's service and support promises. Price, of course, is important too — and we found some exceptional values (see Figure 1).

Whatever the price, any drive larger than 300 megabytes should come with

Macintosh, Volume V. The old partition scheme, known as IM-IV, came out at the same time as the Mac Plus. It contained a simple scheme for setting up partitions under the Mac's hierarchical file system, or HFS. The more recent IM-V update was developed when the Mac II family was required to support partition types other than HFS — such as A/UX and ProDOS, among others. Apple strongly recommends that developers who are writing partitioning software use the IM-V system.

Soft partitions are an entirely different — and dangerous — animal. Instead of being autonomous disk areas with their own directories and data structures, soft partitions are simply large "invisible" files that live *within* a hard partition. Soft partitions had their place — once — but since IM-V partitioning was developed, this need has disappeared. In fact, there are good reasons not to use soft partitions. For example, if the directory of the hard partition is ever corrupted, the data and file structures in the soft partitions can be lost forever. A second problem — less dangerous but sufficiently annoying — is the degradation in performance caused by the Mac's having to go through both the soft partition's driver and the hard disk's driver in order to read or write data.

partitioning software that helps you subdivide the hard-disk space into manageable chunks that appear on your desktop as separate volumes. All but one of the drives we tested — the Deltaic Server 1G — did, although Relax charges an extra \$59 for the privilege. A simple way to evaluate partitioning software is to check its compatibility with A/UX — even if you never plan to use Apple's version of the UNIX operating system. A/UX-compatible drives use software that follows Apple's latest recommended method for hard-partitioning disks, as opposed to earlier schemes, which aren't recommended on drives this big (see the "Partitioning" sidebar).

In addition to good partitioning software, compatibility with the Mac IIx, IIfx, and IIfx and System 7.0 is absolutely essential. Some early driver software doesn't work properly on a

IIsi, IIfx, or IIfx or on any Mac that's running System 6.0.7. We had no problems with any of the drivers included with the gigadrives we tested — if you're looking at a drive that's not included in this report, make sure you conduct your own compatibility test.

Also remember that most failures happen in the first two to four weeks of a drive's life, so you should look for a vendor that offers a money-back guarantee: one with at least a 15-day and preferably a 30-day return period. If the vendor doesn't offer such a guarantee, check the details of the warranty; it may cover early failures. Either way, the guarantee or warranty should apply to any exchanged or replacement drives as well as to the original unit.

The Careful Buyer's Checklist

Doing your preshopping homework doesn't guarantee that you'll get a good product, but it improves your chances enormously. Before signing the check for your new gigadrive, make sure it has all the following:

A UL or CSA Label. Many companies and government organizations require that equipment installed on their premises carries a UL (Underwriters' Laboratories) or CSA (Canadian Standards Association) label, which indicates that a product has been tested and meets UL or CSA safety requirements. Some insurers don't cover damage (by fire or otherwise) caused by unlabeled products. Only the Microtech MicroKCN N1000, Rodime Cobra 1000e, and Storage Dimensions MacinStor 1020-S1 gigadrives had UL or CSA certification at the time of our testing, but all the other manufacturers were in the process of being certified — check if they've been approved before you buy.

An ID Tag. The unit should carry a permanent label bearing the vendor's name and the drive's model and serial number. Most reputable manufacturers use a metallic label that bears the company's logo. If the drive doesn't have such a label, don't buy it. The

Safe Gigadriving



1. Keep the drive spinning. Perpetually. Unless you're moving it, never turn it off, not even when

you turn off your Mac. That way you'll never have problems with *sticktion*, the drive manufacturers' term for what happens when read/write heads adhere so strongly to the platter surface after the drive is powered down that the drive motor can't start the platters spinning again.



2. Keep the drive spinning "flat." Set it up either perfectly horizontally or perfectly vertically, as

determined with a standard carpenter's bubble level.



3. Isolate the drive from vibration. Install your drive so that it's safely away from fans, elevators,

desks that get bumped and kicked, refrigerators with thumping compressors, and passing motor traffic. Perhaps set it on a slab of marble or granite, the way some audiophiles do with turntables for records.



4. Keep the power clean. At a minimum, plug the drive's AC power cord in to a surge-suppressor strip. If you have a UPS (uninterruptible power system), use it.



5. Keep your data backed up. Ideally, back up your disk onto tape or optical discs. A gigabyte of data represents a severely nontrivial chunk of work. If doing backups sounds like a nuisance, just consider how long it would take and how much fun it would be to try to reconstruct the files, starting with an empty drive.



6. Use Disinfectant and other virus-prevention tools. Install the INIT, and at the first hint of trouble, "disinfect" the hard disk — and all other volumes that were mounted since the virus arrived.

Good Housekeeping

Whether your hard drive's capacity is big or small, you can't get away from the problem of how to manage your files. For drives with less than 100 megabytes, you're constricted by the space limit — and having less space to work with often forces you to be a better disk housekeeper. With bigger drives, files pile up all too easily, and the disk can end up looking like Fibber McGee's closet.

Like the contents of that infamous closet, much of what collects in big drives is stuff you probably don't really need. To the pack rat in every user, the space on a gigadrive's disk is simply one big empty closet begging to be filled, and as long as users are human, clutter is inevitable.

To keep the mess to a minimum, anyone who invests in a gigadrive should be prepared to accept the idea of managing data *actively* rather than by benign neglect — or worse, by crisis. Active data management starts with partitioning and includes the habit of backup.

Backup? Ugh. What a chore. Why take the time and trouble to make spare copies of all the data on a huge disk drive? Because power does fail. Drives do die. File systems do get corrupted. Viruses do creep in. Managing data is like staying healthy: No matter how diligently you take precautions, you may not be able to avoid the occasional flu or wrenched ankle. Best be prepared. Backup may be a chore — and for gigadrives it doesn't come cheap — but just imagine trying to rebuild all your files from scratch.

The backup options for gigadrives are relatively limited. With list prices on the order of \$3,000 to \$4,000, WORM (write-once, read-many) drives are expensive — but not as expensive as erasable optical drives, which list for about \$1,000 more. Helical-scan 8mm-tape drives are a popular, less expensive alternative, as are very-large-capacity (150-megabyte) tape-cartridge drives. Standard tape drives cost hundreds of dollars, whereas one that uses DAT (digital audio

tape) can cost as much as \$4,000.

Don't even think about the latest removable backup technology — megafloppies. When they finally appear later this year, their maximum capacity will be around 20 megabytes. They may serve as convenient backup media for 100-megabyte drives but not for drives ten times as large. And forget about any kind of standard floppies, unless you want to spend hours feeding disks to your system. Finally, skip Bernoulli, SyQuest, and Ricoh cartridges. At 40 to 50 megabytes and about \$80 each, they're a very expensive way to back up an entire gigabyte — and that's on top of the cost of the drive itself (several hundred to more than a thousand dollars).

Backing up regularly doesn't mean that you can forget about file housekeeping. Backup programs don't distinguish between clutter and "real" files. If your disk contains a lot of junk, the backup will take longer (maybe a lot longer) than it would if the disk held only your lean-and-mean essentials. But if you try to quickly delete all your junk files before backing up, you may accidentally trash some valuable ones. We recommend that you first do a "long" backup of everything on your disk and then clean off the junk — restoring from the backup any files you've accidentally deleted. Over the long term, this method is both efficient and good for peace of mind. We also recommend that every gigadrive owner have a copy of The Norton Utilities, MacTools Deluxe, or any other utility with an Undelete feature that lets you rescue files from the Trash.

Finally, anyone who isn't supremely disciplined and meticulously organized would do well to read *Clutter's Last Stand* by Don Aslett, published by Writer's Digest Books, Cincinnati, OH 45207; (800) 543-4644 or (513) 984-0717. Aslett's *bête noire* is physical clutter, but much of what he says can be applied directly to the folders and files on your Mac.

lack of a serial number means iffy warranty service. All the drives we looked at had ID tags or manufacturers that promised they would have them by the time this report went to press.

FCC Declaration. It's illegal for dealers or mail-order firms to sell any computer or external peripheral that doesn't have an FCC declaration. This statement, which tells you that the drive complies with the Federal Communications Commission's technical rules and regulations concerning radio-frequency emissions, usually appears on the drive's ID tag. If the statement is missing, don't buy the drive. All the drives we tested were approved by the FCC — we wouldn't have tested them if they hadn't been.

Easy Hookup

When connecting to the Macintosh, the drives we tested fall into two classes: MicroNet's and everybody

else's. Unlike the others, the two MicroNet drives don't hook into the Mac's SCSI port. Instead each connects to a MicroNet NuPort card — a NuBus SCSI accelerator that can transfer data in bursts more than twice as fast as our Mac IIci test platform's transfer rate.

To connect either of the MicroNet drives, you install the NuPort card in any NuBus slot in your Mac II, IIx, IIcx, IIci, or IIfx — or to the NuBus adapter available for the IIsi — and then cable the card to the hard drive. If your system is a Classic, Plus, LC, SE, or SE/30, you're limited to the MicroNet SB-1000NP, which you can connect to the SCSI port of those CPUs via a standard SCSI cable — you lose the advantage of the NuPort card, though. The SB-1000NP's sister product, the SBT-1288NP, requires the use of a NuPort card.

The SBT-1288NP is unique among the systems we tested in that it consists

of not one drive mechanism but two 644-megabyte Wren-Runner 2 drives operating together (see the "How It Works: Dual-Mechanism Drive" sidebar). To applications and to the Mac's operating system, the two Wren-Runners look and run like a single drive.

All the non-MicroNet drives we tested came with 25-to-50-pin SCSI-to-Mac adapter cables. If you have other devices — a scanner, a tape drive, or another hard drive — you can use 50-to-50-pin SCSI-to-SCSI cables to add the drive to your SCSI-device daisy chain. Setting the SCSI address on most drives is as easy as pushing a button or turning a dial; only the APS I Gig, Rodime Cobra 1000e, and Tulin A-Hive Hard Drive force you to contend with DIP switches.

You'll also want to ensure that the signals that travel over the bus stay clean. You do that by making sure that

both ends of the SCSI bus are properly terminated — that is, that the first and last devices on your SCSI chain have external terminators installed, a termination switch or switches set to on, or internal terminators preinstalled. If either or both of the terminators are missing, your Mac may not recognize your drive — or any other device in your SCSI chain.

Most SCSI devices use an external *flow-through* terminator plug, which fits into the unused SCSI port on the back of the drive. If you need to place

your new gigadrive in the middle of your SCSI chain and if your drive is from HDI, La Cie, MacLand, MacTown, Microtech, or Rodime, you'll have to perform surgery to remove the terminator from inside the drive's case. For greater ease of use, we prefer drives that use an external terminator.

Floor Plans

Your new gigadrive is cabled and connected, and you're ready to start organizing it to receive your files. Now

come the decisions: To partition or not to partition? How many partitions and what size? And at what interleave should you format?

Many drives come preformatted. The APS 1 Gig, MacProducts Magic 1.2 Gig HD, MacTel HD Index Gigabyte, and PLI PL 1.2 Gig even come with public-domain or shareware software preinstalled. But if you want to get the most out of your drive, expect to reformat the hard disk and to set up partitions different from those the vendor created. Only one drive, the

Figure 1: Gigadrive Bargains

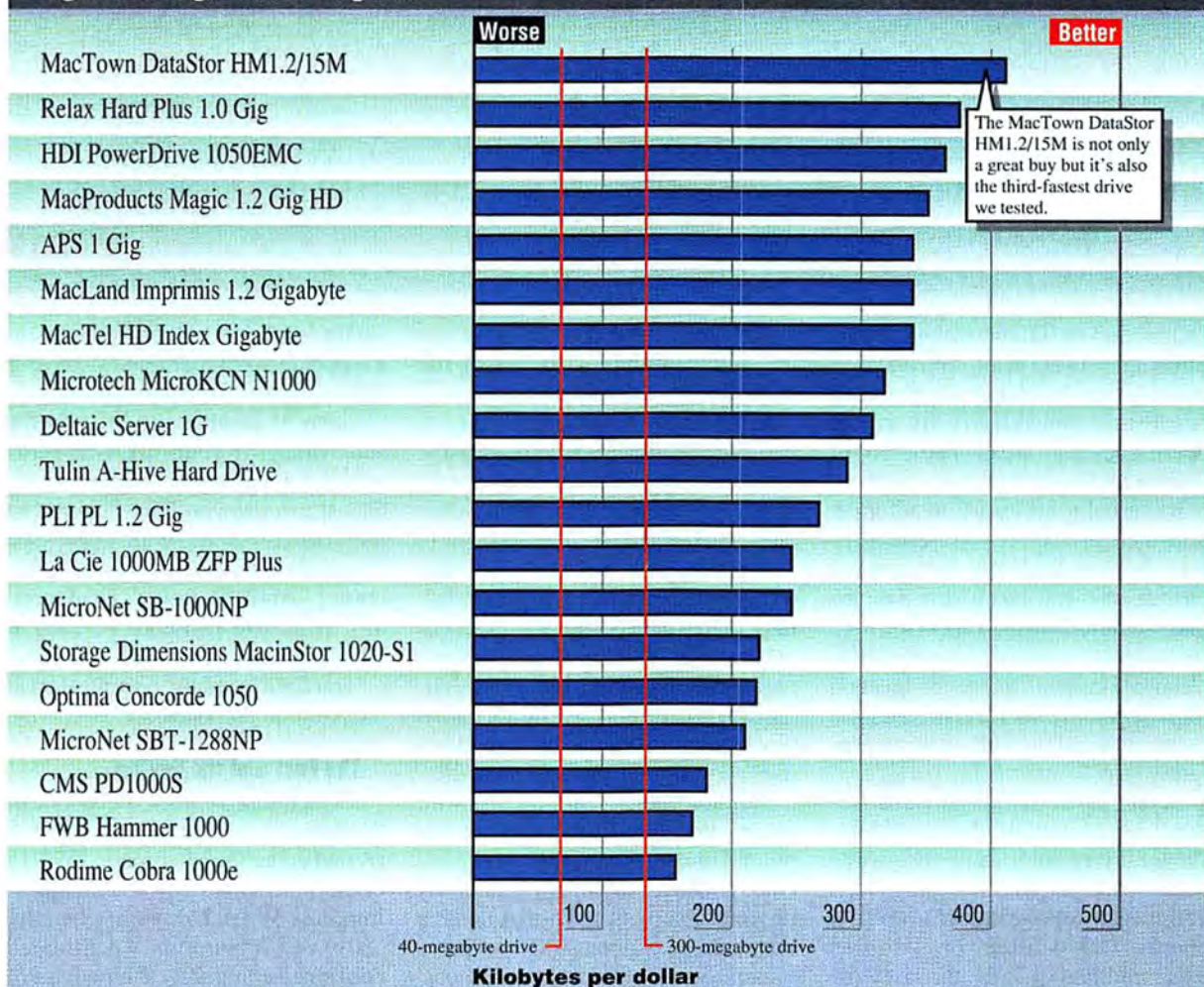


Figure 1: Although gigadrives may seem expensive, you get a lot of space for each storage dollar. When compared with smaller drives, a gigadrive can be a real bargain. Because gigadrives can often be found for sale below the manufacturer's list price, we called dealers around the country to determine actual prices as of March 1991 and used these street prices — along with direct prices charged by mail-order houses — to calculate the number of kilobytes of storage space per dollar compared with that of average-priced 40-megabyte and 300-megabyte drives.

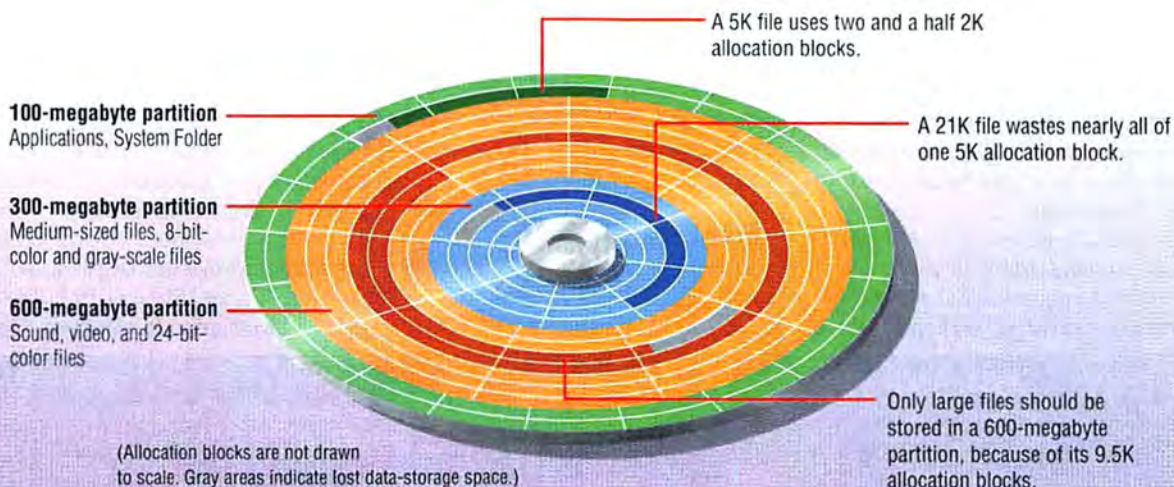
Figure 2: Recommended Gigadrive Partitions

Figure 2: The larger the disk partition, the larger the building blocks used for each file — and the more space that goes unused. Correct partitioning of your gigadrive can significantly reduce this waste. Three partitions — one each of 100, 300, and 600 megabytes — work well for gigadrives used for color images, very large databases, or multimedia applications. Gigadrives used as office file or mail servers do well with five 200-megabyte partitions.

Deltaic Server 1G, comes with no partitioning software at all. And only one drive — the MacLand Imprimis 1.2 Gigabyte — comes with software that doesn't let you create partitions of different sizes.

It's usually necessary to reformat your hard disk before you create partitions, because the partitioning process changes the way data is stored on the disk. Some disk-management software forces you to wipe the disk completely clean before you change the location of its partitions, whereas others let you do the remodeling without this preparatory step.

Small (20- to 100-megabyte) drives don't need multiple disk partitions. Larger drives do, because they waste more space per file. For example, a 150-megabyte drive stores files in 2.5K chunks. Unless a file consists of an exact multiple of 2.5K, the last 2.5K chunk of space for that file will be only partly filled. Multiply this partly filled chunk by the total number of files on a disk, and the leftover empty bytes can add up.

The larger the disk — or the larger the disk partition — the larger the allocation block, or smallest chunk of data that can be written to the disk or partition. A gigadrive with no partitions stores data in allocation chunks of 16K — meaning that each file contains, on average, 8K of empty space. Partitioning software breaks the uninterrupted expanse of a 1-gigabyte disk into more-manageable chunks. For example, a 600-megabyte partition uses 9.5K allocation blocks, a 300-megabyte partition uses 5K allocation blocks, and a 100-megabyte partition uses allocation blocks of a mere 2K.

Partition your gigadrive's disk with these allocation-block numbers in mind. For example, if you work with color graphics, you might want to set up your disk with three partitions: a boot volume of about 100 megabytes for your System files and applications, a 300-megabyte area for small images, and a 600-megabyte area for large images (see Figure 2). This way you can stockpile your large 24-bit-color images in the big room, ensconce

smaller and less colorful pictures in the middle-sized room, and store your administrative files in the closet.

Safety is another good reason for subdividing. If your disk is unpartitioned and something happens to its data structures, you'll have to restore the contents of the entire disk (see "Surviving the Crash: Hard-Disk Recovery," April '91, Buyer's Guide page 42). With hard partitions — each of which contains its own data structures — you need to restore only the data in the partition that blew up.

The Fast and the Faster

As mentioned earlier, all but one of the drives in our test group were built around either the Micropolis 1598-15 drive mechanism or the Seagate/Imprimis Wren 7 drive mechanism. So we weren't surprised when they all performed admirably. But perhaps of more central importance than the drives' nearly identical performance is that today's Macs can't begin to keep up with the raw data-transfer rates of gigadrives.

Both the Wren 7 and the Micropolis 1598-15 drive mechanisms can read and write data at a sustained rate of 2.3 megabytes per second. The Wren-Runner 2 mechanism in the MicroNet SBT-1288NP can zip along at a fast 3 megabytes per second. However, not even the Macs with the fastest SCSI ports — the IIci and the IIsi, rated at about 2 megabytes per second — can match a gigadrives's best performance. And most members of the Mac II family — including the flagship Mac IIx — poop out at about 1.5 megabytes per second. A gigadrive without a MicroNet NuPort SCSI card is like a

Ferrari stuck in a school zone. What's more, simply moving data is easier than processing it; even an efficiently written application running on a Mac IIx — the Mac with the fastest microprocessor — has trouble handling more than 600K's worth of data per second.

To give each gigadrive its best opportunity to prove itself, we used the Mac SCSI champ — the IIci — for our testing. We began with MacUser Labs' tried-and-true hard-disk-drive benchmark test, DiskBasher, which we've found to be an excellent predictor of real-world performance (DiskBasher

is available free on Zmac). We first observed that the four drives with the Micropolis mechanism — the CMS PD1000S, Deltaic Server 1G, HDI PowerDrive 1050EMC, and Tulin A-Hive Hard Drive — ran slightly slower than the drives that have the Wren 7 mechanism (see Figure 3). A major reason is that the Wren 7's 256K cache is four times as large as that of the Micropolis mechanism. Among the four Micropolis drives, the three slower ones — from CMS, HDI, and Tulin — did not have the most recent ROMs. The performance of the Deltaic Server 1G — with new ROMs — was almost

On the Horizon

Hard-drive manufacturers continue to cram more storage space into smaller units while improving overall performance. You can now store on your desktop what used to require a disk farm in a 3,000-square-foot room.

The gigadrives we tested are good examples — and since we began testing, they've been joined by similar units from Club Mac, Cranel, Crate Technology, Data Enhancements, MacDirect, Maya Computer, Peripheral Vision, Procom Technology, Summus Computer Systems, Third Wave Computing, TMS, and Wherehouse 54. It seems that the gigadrive market is alive and well.

The same 5.25-inch Seagate and Micropolis mechanisms used in gigadrives can, with suitable brackets, fit *inside* a Mac II, IIx, or IIcx. If you have a smaller IIcx or IIci, which uses a 3.5-inch hard-drive mechanism, you are currently limited to around 210 megabytes. However, Fujitsu has just announced a 15-millisecond, 600-megabyte drive that fits inside the small-footprint Macs. Look for it soon.

For those who demand the ultimate in gigadrive performance, MicroNet has begun shipping its new Raven series. A Raven system consists of two drive mechanisms, two cables, and two NuPort controller cards that plug in to adjacent NuBus slots in your Mac II. Priced at \$12,490 for a 2-gigabyte system and \$16,490 for a 2.6-gigabyte system, the Raven is built for raw speed, transferring alternating bytes of data to each drive over independent SCSI buses instead of a steady stream of sequential sectors over a single SCSI bus, as do the SB-1000NP and SBT-1288NP, evaluated in this report. MicroNet claims average access time of less than 6 milliseconds and sustained throughput of 4.1 megabytes per second — pretty impressive numbers, if true. MacUser Labs looks forward to testing the Raven series, along with other SCSI-accelerated systems now appearing from DayStar and others. MicroNet Technology, Inc., 20 Mason, Irvine, CA 92718; (714) 837-6033.

Even if the Ravens' performance proves less spectacular than its creators claim, its dual controllers, cables, and mechanisms can provide the safest, most secure storage environment possible: redundancy. If any component (other than the Mac itself) fails such that one drive is unusable, security software (soon to be released by MicroNet) will automatically switch over and use the working drive until you can fix the broken component. The software includes the ability to copy data from one drive to the other so that when you bring



MicroNet Raven systems use two NuPort SCSI accelerators — one for each drive mechanism — to achieve fast and secure performance.

the failed subsystem back up, the two drives are in sync again.

And if the Raven is not big or secure enough for you, you'll be able to turn to Core International for the ultimate high-speed, high-security Mac storage device, the CPR-400 intelligent-array system. The CPR-400 contains five 1-gigabyte Core mechanisms — four for data and one for parity — resulting in 4,000 megabytes of storage space. The CPR-400 is designed for systems that can't afford a second of downtime caused by a hardware glitch: Any drive, controller, or power supply can be replaced without your powering down the entire unit — the driver software reconstructs missing data from information stored on the parity drive. Because data is shared across four synchronized drives, read and write times are cut to 25 percent of single-drive performance. Add an 8-megabyte disk cache, and you have one remarkable SCSI device — and at \$64,600 for the CPR-400, one remarkable dent in your cash flow. Of course, you could always settle for the CPR-400's smaller siblings, the 1.3-gigabyte CPR-100 (\$32,500) or the 2.6-gigabyte CPR-200 (\$43,500). Core International, 7171 N. Federal Highway, Boca Raton, FL 33487; (407) 997-6044.

equal to that of the top Seagate/Imprimis Wren 7 drives. The superfast 6-millisecond access time of the MicroNet SBT-1288NP enabled it to score well above the pack.

Our next test, using Adobe Photoshop, put stress on each gigadrive by making it perform many small contiguous reads and writes — much as does the virtual-memory scheme built

in to System 7.0 — an excellent test of the strength of the drives' mechanism and ROM. The PLI PL 1.2 Gig and Rodime Cobra 1000e drives, for example, which both contain an earlier

Figure 3: Gigadrive Performance

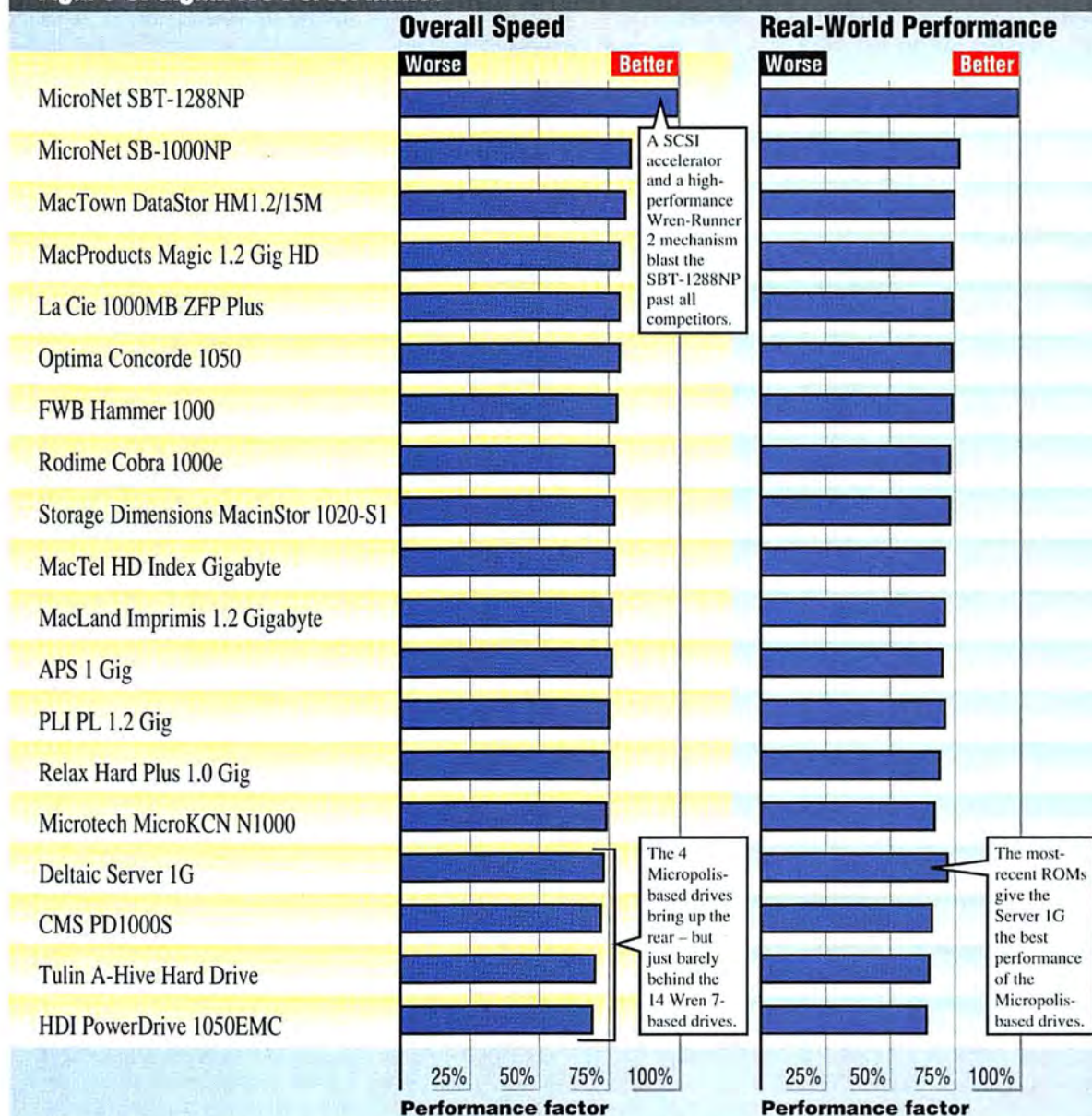


Figure 3: Gigadrive performance is determined by the speed of the drive's mechanism and the quality of its driver software. Micropolis-based drives, with their 64K on-board caches, can't quite keep up with the 256K cache-equipped Seagate Wren 7 mechanisms. The lag is so slight, however, that you'll rarely notice any difference.

Overall Speed:

We determined overall speed by combining the test results of each drive in each of three sets of tests. Real-world-performance results

contribute 50 percent of the final rating; the other two tests contribute 25 percent each. These results and those for the individual tests are shown as a percentage of the speed achieved by the all-around champ, the MicroNet SBT-1288NP.

Real-World Performance:

The MacUser Labs DiskBasher benchmark writes and reads 10 megabytes of medium-sized files, giving an accurate simulation of real-world performance. All the drives performed almost equally well,

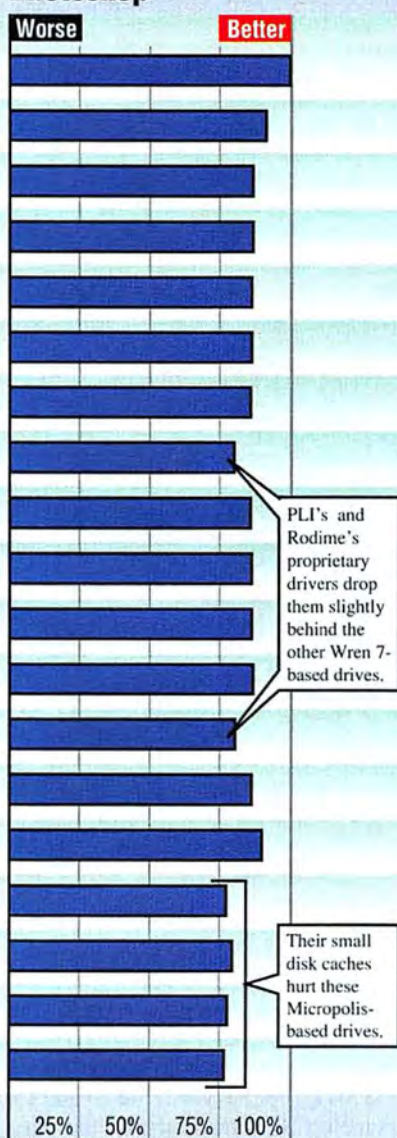
version of Wren 7 ROM, were noticeably — although not significantly — slower than the other Wren 7-based drives. Again the SBT-1288NP's access speed put it on top.

We then used the popular shareware benchmark test SCSI Evaluator (also available on Zmac) to see how quickly each gigadriver could send files of various sizes through the fast SCSI port of

our IICI test Mac. SCSI Evaluator reported data-transfer rates of 1.5 to 2.5 megabytes per second.

SCSI Evaluator tests show not only drive performance but also software

Photoshop



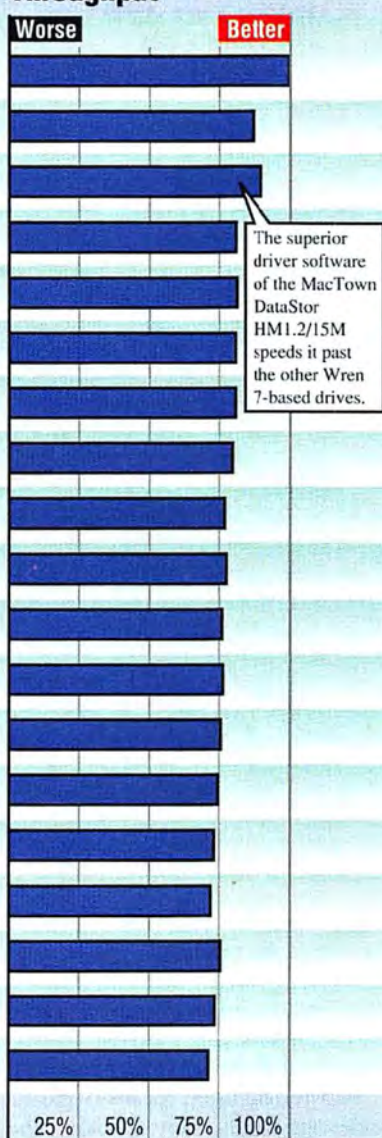
Performance factor

except for the MicroNet SBT-1288NP, which was more than 20 percent faster than its nearest competitor. Individual DiskBasher results are listed in Table 2.

Photoshop:

To test an application commonly used by purchasers of gigadrives as well as the type of quick sequential seeks characteristic of the virtual-memory feature of System 7.0, we timed how fast Adobe Photoshop could rotate a 30-megabyte color image by 90 degrees.

Throughput



Performance factor

The Micropolis-based drives' slower performance shows the drawbacks of their small caches.

Throughput:

We used the popular shareware benchmark utility SCSI Evaluator to determine the read, write, and seek performance of all the drives when unencumbered by a specific application. Again, the MicroNet SBT-1288NP led the pack in cumulative performance, and the MacTown DataStor HM1.2/15M showed surprising speed as the runner-up.

MicroNet SBT-1288NP

MicroNet SB-1000NP

MacTown DataStor HM1.2/15M

MacProducts Magic 1.2 Gig HD

La Cie 1000MB ZFP Plus

Optima Concorde 1050

FWB Hammer 1000

Rodime Cobra 1000e

Storage Dimensions MacinStor 1020-S1

MacTel HD Index Gigabyte

MacLand Imprimis 1.2 Gigabyte

APS 1 Gig

PLI PL 1.2 Gig

Relax Hard Plus 1.0 Gig

Microtech MicroKCN N1000

Deltaic Server 1G

CMS PD1000S

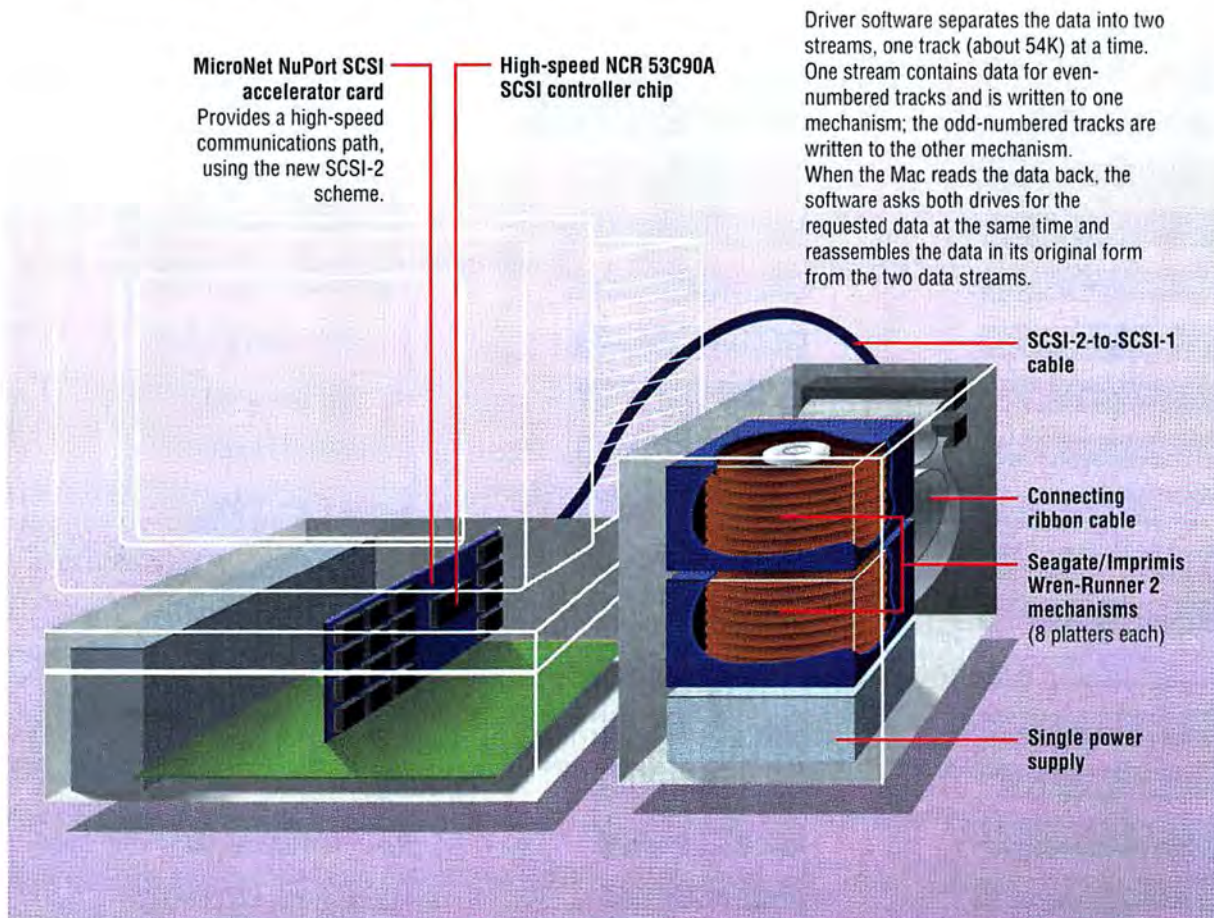
Tulin A-Hive Hard Drive

HDI PowerDrive 1050EMC

How It Works: Dual-Mechanism Drive

To speed up hard drives, designers use many tricks, such as packing more bits onto each track or revving up the platters to 4,400 or 5,400 rpm. One scheme — used by MicroNet in its superfast SBT-1288NP and its new Raven-series drives — is to distribute the data

in parallel across two drive mechanisms and access those drives simultaneously. This method works best when your application reads and writes a lot of data — 512K to 1 megabyte — each time it accesses the drive.



Driver software separates the data into two streams, one track (about 54K) at a time. One stream contains data for even-numbered tracks and is written to one mechanism; the odd-numbered tracks are written to the other mechanism. When the Mac reads the data back, the software asks both drives for the requested data at the same time and reassembles the data in its original form from the two data streams.

performance — that is, the quality of each drive's driver software and how well it interacts with the Finder. That performance may have changed since we ran these tests, however: Driver software is easier to modify than ROM, and at press time, several vendors told us they'd be introducing updated versions of their driver software over the next several months.

The hands-down winner in all tests was the \$9,990 MicroNet SBT-1288NP. The SBT-1288NP contains two superperformance Seagate Wren-Runner 2 drives that spin at 5,400 rpm — 1.5 times as fast as the rate of the

Seagate or Micropolis drives used in the rest of the products. A faster spin rate not only cuts down on the time the drive's read/write heads must wait until the data it's looking for passes underneath but it also means that the data can be transferred faster, because it passes under the heads more quickly. The SBT-1288NP's driver divides data into two streams — one for each drive — again increasing the data throughput. To keep the Mac's SCSI port from slowing things down, MicroNet includes a NuPort SCSI accelerator card.

Despite this technological edge, however, the SBT-1288NP had only a

5-to-10-percent advantage over the average Wren 7 drive on the throughput tests — whether that's enough to justify its premium price is up to you and your accountant. In the DiskBasher and Photoshop tests, on the other hand, the SBT-1288NP was a full 25 and 15 percent faster, respectively, than the nearest non-NuPort drive. If that extra performance is worth an additional \$5,000 to \$7,000, go for it.

High-End Service

Each vendor offers at least a one-year warranty on parts and labor: If your gigadrive fails, the company will

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We give you more options. Our own MacAvenue product line of hard drives, monochrome and color displays, modems and scanners gives you a value-priced alternative for Mac peripherals. For example, our hard drive is more than just another pretty case. Its metal interior and plastic exterior — designed like the Mac's — controls air flow and buffers the drive noise. When you work with the MacAvenue drive, all you hear is the sound of one hand clapping. But don't take our word for it. Ask Robert Wiggins, *MacUser's* longtime business columnist, who gives the Protegé drive his "highest recommendation."

Protegé Hard Drives

Capacity	External		Internal	
	Seagate	Quantum	Seagate	Quantum
20+MB	\$345	n/a	\$295	n/a
40+MB	\$395	n/a	\$325	n/a
50+MB	n/a	\$479	n/a	\$349
80+MB	\$525	n/a	\$465	n/a
100+MB	n/a	\$669	n/a	\$539
200+MB	n/a	\$979	n/a	\$899

The 15", ultra-high resolution screen of the Protegé features a complete 8 1/2" x 11" page with no reduction of image size or quality. Complete with video card, it's only \$495. Or get a 2-page view with the 20" Protegé Dual-page Display for a mere \$895. And each Protegé monitor comes complete with After Dark and Now Utilities software — **FREE!** For a second opinion, ask Bob LeVitus, author of *Dr. Macintosh*, who says, "I love the crisp, bright image I get with a Protegé Display. And with the 30-day, no-questions-asked, money-back guarantee, you just can't go wrong. I highly recommend the Protegé Display."

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If you experience a problem with anything you purchase from MacAvenue, call our product support staff at 800-766-6221 weekdays from 8:00 am to 7:00 pm, CST. We can usually resolve your technical problems over the phone.

3 Extended Limited Warranty
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Outbound Laptop System w/ 512KE ROMs, 2MB RAM and 40MB Drive22000	\$3439
Outbound Laptop System w/ 512KE ROMs, 1MB RAM and Floppy Drive22201	\$2699

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Daystar		
FastCache IIci23657	\$27
SCSI PowerCard23655	\$125
Dove		
Marathon 030 Accelerator for Mac Plus23653	\$54
Sigma Designs		
DoubleUp w/ DiskDoublers	.....23656	\$17
Technology Works		
IIci Cache Card w/ 64K	.....23648	\$26

MEMORY EXPANSION

Applied Engineering		
1MB Upgrade for MacRam Portable Card	.....25488	\$35
MacRam Portable Card w/ 1MB25487	\$49
Technology Works		
Mac Portable 3MB Upgrade Kit25486	\$89

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ADB Mousestick25286	\$6
ADB SuperMouse25289	\$9
Cutting Edge		
Keyboard25188	\$11
DataDesk		
Mac 101E Keyboard25187	\$13

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Digital Vision		
Computer Eyes Color22759	\$348
Kodak		
M150 Mac Portable22855	\$519
Relisys		
Tefax RA2110	.....22700	\$895
Seiko		
Label Printer	.....22852	\$184
Seikosha		
Personal Printer SL2000AP	.....22857	\$235
Texas Instruments		
1MB memory upgrade kit	.....38563	\$259
microLaser Toner Cartridge	.....38311	\$46

COMMUNICATIONS

Applied Engineering		
DataLink Express	.....22306	\$169
DataLink LC	.....22320	\$257
Farallon Computing		
PhoneNET Connector Din-8	.....22513	\$31
Nuvotech		
Nuvolink SC	.....22535	\$389
Shiva		
NetSerial X232	.....22504	\$275

Ethernet Connector for LocalTalk Printers

The **EtherPrint** connector simplifies the Ethernet/LocalTalk printer connection. The Dayna Etherprint makes a simple "plug-and-print" connection fast and cost effective. Includes adaptors for any cable/printer combination.

EtherPrint (Dayna)22541	\$355
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STORAGE DEVICES

Applied Engineering		
High-Density 3.5" 1.44K Floppy Drive24736	\$239
Cutting Edge		
800K Floppy Drive	.....24731	\$99
Iomega		
Mac 1B Interface Kit	.....23834	\$48
TransPortable 44MB	.....24393	\$999
Kennect Technology		
Drive 2.4 (3.5")	.....24730	\$328
MacAvenue		
HD Carrying Case	.....26908	\$24
NEC		
CD-ROM Reader CDR-36 w/ I/F	.....24636	\$499
CD-ROM Reader CDR-73 w/ I/F	.....24634	\$729
Premium Type Gallery PS w/ CDR-73	.....24635	\$9995
PLI		
TurboFloppy 1.4	.....24741	\$359
Quantum		
52MB LPS Internal - (IIcx,ci)	.....24194	\$349
52MB LPS Internal - (SE-IIx)	.....24198	\$349
105MB LPS Internal - (IIcx,ci)	.....24195	\$539
105MB LPS Internal - (SE-IIx)	.....24199	\$539
210MB Internal - (IIcx,ci)	.....24196	\$899
210MB Internal - (SE-IIx)	.....24200	\$899

Unlimited Data Storage

With a Syquest Removable Cartridge Disk Drive, you'll never run out of disk storage — you just add additional cartridges. Transporting large files is much easier, because the 5 1/4" 44MB cartridges can be shipped without a hitch. The Syquest offers 20ms seek time and fast transfer rates. Includes cartridge.

Cutting Edge Syquest Removable Cartridge Disk Drive24401	\$597
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Boost Hard Drive Performance

DayStar's **SCSI PowerCard™** uses a memory buffer, caching software and a fast SCSI port to help your drives operate at super speed. Works with any SCSI storage device — hard drive, CD-ROM, or Syquest removable media drive.

DayStar SCSI PowerCard23655	\$1259
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Global Village TelePort/FAX 9600



It's easy to send FAXes from any application's menu bar with this elegant, compact 9600 baud SendFAX and 2400 baud MNP5 data modem. TelePort connects to your Macintosh by ADB, just like your mouse, freeing your modem port and eliminating a power cord. An Eddy Award winner.

TelePort/FAX 960022314	\$195
TelePort (modem only)22311	\$145

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SE/30 8-Bit 640X48023541	\$345
RasterOps		
Grey Scale 19" monitor GS for Mac II22007	\$1614
RasterOps 24L	.....23555	\$3179
RasterOps 24S	.....23557	\$729
RasterOps 24STV	.....23568	\$1549
RasterOps 264/SE30	.....23539	\$685
RasterOps 8L	.....23554	\$1619

ACCELERATOR AND EXPANSION BOARDS

DayStar		
40MHz PowerCache IIci w Coprocessor	.....23651	\$1167
40MHz PowerCache IIci w/o Coprocessor	.....23652	\$947

Enhanced microLaser

Texas Instruments has added 16 page-per-minute printing speed to their popular line of microLasers, the printer that was awarded 4½ mice from MacUser. The microLaser XL offers the same quality output as the original microLaser and it offers added upgrade flexibility.

TI microLaser XL		
35 font w/ AppleTalk	.....22859	\$3095
17 font w/ AppleTalk	.....22858	\$2795
TI microLaser		
35 font w/ AppleTalk22851	\$1749
17 font w/ AppleTalk22856	\$1429

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PowerKey (Sophisticated Circuits)25030 \$64

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Mac-101 Keyboard Beige (Plus)25181 \$134
 SWITCHBOARD25182 \$159
 Kensington Turbo Mouse ADB25281 \$107
 MacAvenue 01 Extended Keyboard ADB25186 \$99
 T3600 Digitizing Tablet23734 \$295

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 PS 370ci26294 \$329
 Bernoulli B33C 44MB Tape Cart57804 \$95
 In Magnetics External Tape Back-Up 5040/6023832 \$529
 Kensington Mac Classic Anti-Glare Clip-on Filter26924 \$49
 Anti-Glare Clip-on Filter, platinum26922 \$56
 Anti-Glare Filter, platinum26883 \$32
 Cable MacSpeaker26923 \$179

Versatile Network Connection

The Asanté MacCon+ EtherNet boards are among the fastest EtherNet boards on the market. The MacCon II gives you the highest return on your network investment through full compatibility with AppleShare, NetWare and TOPS. Supports 32-bit data transfers at speeds up to 10MB/second.

Asanté MacCon+ SE/30E thk/thn22526 \$375
 Asanté MacCon+ IIE thk/UTP22529 \$375
 Asanté MacCon+ IIE thk/thn22538 \$375

SOUND INTERFACES

Articulate Systems
 Voice Navigator II23736 \$649
 VoiceLink23738 \$199

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 Adobe Plus Pack v1.029834 \$129
 Streamline v2.029269 \$129
 TypeManager v2.029825 \$64
 Aldus
 PageMaker v4.029781 \$497
 Broderbund Software
 Typewriter v1.530450 \$115

Add Serial Devices



The QuadraLink from Applied Engineering makes quick work of Mac II system expansion by adding four serial ports to your Mac. This NuBus card is easy to install and is compatible with System 7.0. A special "shadow driver" insures compatibility with older software.

QuadraLink (Applied Engineering).... 26917 \$205

Claris
 Claris MacWrite II v1.130586 \$142
 DeltaPoint
 Taste30638 \$86
 Microsoft
 Microsoft Word v4.030582 \$245
 Personal Press v1.029916 \$199
 Reference Software
 Grammatik Mac v2.030634 \$50
 Timeworks
 Publish-It Easy! v2.029896 \$145
 Writing Tools Group
 Correct Grammar v2.030633 \$49

BUSINESS SOFTWARE

ChipSoft
 Turbo Tax28500 \$51
 Intuit
 Quicken v1.528458 \$39
 MECA
 Managing Your Money v4.028467 \$142
 Microsoft
 Microsoft Office Bundle30182 \$525
 Microsoft Works v2.030581 \$194
 Nolo Press
 WillMaker v4.029888 \$37
 Reality Software
 WealthBuilder v1.028496 \$145
 Software Toolworks
 Dollars & Sense v5.028465 \$86

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Don't forget to maximize your Macintosh with MacAvenue's memory bargains. Only the best surface-mounted 80 nanosecond memory products from Technology Works. Call for further pricing information.

2 x 1MB SIMM Kit, 80ns25480 \$117
 4 x 4MB SIMM Kit, 80ns25481 \$999
 4 x 1MB SIMM Kit, 80ns25482 \$234
 1MB module for Mac Classic25493 \$89
 3MB module for Mac Classic25495 \$199



Too Much Fun

No matter what kind of fun you might be in the mood for, MacAvenue's new Fun Pak II has just what you need! Take your pick — from Apache Strike's fast-paced action to the calmer strategies of Shanghai. You'll be a winner every time! Also includes Solitaire Royale, Talking Moose and Dark Castle — more than \$200 worth of software for only \$49.95.

MacAvenue Fun Pak II29410 \$49.95

Acus
 4th Dimension v2.127780 \$489
 Claris
 Claris FileMaker Pro27789 \$216
 Fox Software
 FoxBase + Mac v2.127791 \$292
 Informix
 Wingz v1.130184 \$253
 Microsoft
 Microsoft Excel v3.030181 \$307

Fire The Typists!

The Dest Personal Scan system is a hardware/software combination that automatically scans up to 10 documents, or works as a full-page hand scanner. The Personal Scan System is bundled with Recognize!, the OCR software that manages every job beautifully for most popular word processing and desktop publishing applications.

Personal Scan w/Recognize! (Dest).....22762 \$699

On Technology
 Meeting Maker - 10 pk30644 \$549
 Meeting Maker - 5 pk30642 \$289

COMMUNICATIONS

I.B.S.
 DataClub v1.127748 \$199
 Insignia Solutions
 Soft PC AT-EGA Add-on Module27716 \$125
 Soft PC v1.327714 \$245
 Sitka
 MacTOPS Network Bundle27682 \$203
 Technology Works
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Adobe Type On Call	30650	\$49
Chinon CD-ROM drive with Adobe Type on Call	24638	\$569

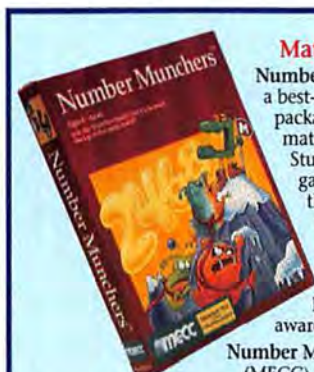
EDUCATION AND ENTERTAINMENT

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Ishido	28776	\$32
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Stupid Mac Tricks	28750	\$19
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Playroom v1.1	28770	\$32
SimCity Supreme (Mac II)	28680	\$47
SimCity v1.2	28678	\$29
SimEarth	28764	\$45
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Where in the World is Carmen Sandiego?	28672	\$29
Where in Time is Carmen San Diego?	28774	\$29
Centron		
Casino Master	28758	\$48
Casino Master Deluxe	28760	\$58
Davidson & Assoc.		
Math Blaster Mystery	27970	\$29
Electronic Arts		
Earl Weaver Baseball	28768	\$32
Pipe Dreams	28740	\$17
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Darwin's Dilemma	27840	\$31
Tesseract	27838	\$30

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Life & Death	28658	\$32
Mavis Beacon Teaches Typing	28056	\$32
Spectrum Holobyte		
Faces	28766	\$24
Falcon v2.2	28614	\$30
Tetris	28606	\$25
Welltris	28604	\$25
StudyWare		
ACT v1.0 w/ Cliffs Notes	28046	\$29
SAT v1.0 w/ Cliffs Notes	28044	\$29
Zondervan		
MacBible-New International Version	28048	\$72

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Adobe		
Illustrator v3.0	29789	\$378
Photoshop v1.0.7	29266	\$543
Aldus		
Persuasion v2.0	29782	\$327
Broderbund Software		
Print Shop v1.3.1	29836	\$35
Claris		
Claris HyperCard v2.0 Development Kit	30578	\$145
Claris MacDraw II v1.1	29204	\$289
Claris MacDraw Pro v1.0	29205	\$289



Math for Fun

Number Munchers is a best-selling software package that makes math fun to learn! Students play the game and learn at their own pace – identifying numbers and numerical expressions. A Parents' Choice award winner.

Number Munchers (MECC)	28034	\$29
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Electronic Arts		
Studio/32 v1.0	29318	\$445
Generic Software		
Generic CADD	29280	\$99
Innovative Data Design		
MacDraft v2.1	29241	\$278
Paracomp		
Swivel 3D Professional v1.0	29294	\$437
Symantec		
THINK C v4.0	27586	\$165
THINK Pascal v3.0	27584	\$166
Wolfram Research		
Mathematica/Mac II v1.2	29270	\$715

SAFETY, MAINTENANCE, REPAIR UTILITIES

Adobe		
Adobe Type On Call	30560	\$49
Berkley Systems		
After Dark v2.0	30425	\$24

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Double-Up with DiskDoubler (Sigma)	23737	\$1
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Baseline		
Thunder 7	30570	
Fifth Generation		
Suitcase II v1.2.3	30402	
GDT		
Paralink Express	30548	
PrintLink Collection (Serial) v4.0	30448	
Ibis Software		
Protector Shark	30538	
Insight Development		
MacPrint v1.2	30428	
Microcom		
Virex	30413	
Now Software		
Now Utilities v2.0	30498	
Sallent		
Disk Doubler v3.0	30546	
Symantec		
Sum II v2.0	30340	
SAM v3.0	30343	

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FilmMaker (Paracomp)	29900	\$4
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Table 1: Service and Support

● = yes ○ = no	Standard warranty	Extended warranty	Money-back guarantee	Service center	Guaranteed turnaround	Data-recovery service?	Toll-free tech support?
APS 1 Gig	1 year	none	30 days	direct	48 hours	●	●
CMS PD1000S	1 year	\$499/yr	none	dealer	48 hours*	○	○
Deltaic Server 1G	1 year	\$300/yr	15 days	direct	72 hours	●	●
FWB Hammer 1000	1 year	\$584/yr	none	dealer or direct	48 hours	●	○
HDI PowerDrive 1050EMC	1 year	\$243/yr	30 days	direct	none	○	●
La Cie 1000MB ZFP Plus	2 years	none	none	direct	72 hours	●	●
MacLand Imprimis 1.2 Gigabyte	2 years	none	30 days	direct	48 hours	●	●
MacProducts Magic 1.2 Gig HD	1 year	\$280/yr	30 days	direct	72 hours	●	○
MacTel HD Index Gigabyte	1 year	none	none	direct	48 hours	●	○
MacTown DataStor HM1.2/15M	1 year	none	30 days	direct	48 hours	○	●
MicroNet SB-1000NP	1 year	\$295/yr	none	dealer or direct	48 hours	○	○
MicroNet SBT-1288NP	1 year	\$295/yr	none	dealer or direct	48 hours	○	○
Microtech MicroKCN N1000	5 years	none	none	dealer or direct	48 hours	●	●
Optima Concorde 1050	1 year	\$900/3 yrs	30 days	dealer or direct	24 hours	○	○
PLI PL 1.2 Gig	1 year	\$900/yr	15 days	dealer or direct	none	●	●
Relax Hard Plus 1.0 Gig	1 year	none	30 days	direct	48 hours	●	○
Rodime Cobra 1000e	2 years	none	none	dealer	72 hours	○	○
Storage Dimensions MacinStor 1020-S1	2 years	none	none	dealer or direct	48 hours	○	○
Tulin A-Hive Hard Drive	1 year	none	none	direct	48 hours	●	○

*For \$250, CMS provides a 24-hour-turnaround guarantee.

Table 1: Service and support should not be judged only by the length of the warranty. Also take into account the cost of a warranty extension, the availability of phone support and a money-back guarantee, the location of the repair service, the repair turnaround time, and whether the vendor offers data-recovery services.

replace it with a new one. Eleven of the eighteen vendors offer 48-hour turnaround for replacement, and four offer 72 hours. Optima stands alone at 24 hours. Only HDI and PLI don't guarantee their turnaround time.

MacLand has the most comprehensive customer-satisfaction package, with a two-year warranty, 30-day money-back guarantee, and 48-hour turnaround. Microtech seems most confident about its quality control, as it offers the only five-year warranty; we would feel a bit more comfortable if it also offered a money-back guarantee. But to be fair, most gigadrives either work right away or not at all. A drive that does work right away is likely to go on working flawlessly.

Eleven of our vendors say they offer data-recovery services. That is, they try to transfer data from a dead drive to a new live one. At press time, several vendors were researching whether data-recovery services were a reasonable thing to offer.

Big Is Beautiful

Gigadrives are no longer exotic, pricey luxuries for the data-rich. For many users, they're rapidly becoming necessities—especially for those who work with video, audio, or high-end graphics or need to analyze very large masses of data. The mechanisms at the heart of these drives have been around long enough to reach a stable state in terms of both price and performance, and their performance challenges today's Mac systems.

The size of these drives forces you to pay attention to how your files are organized, but that's no bad thing. Neatness—including regular backups—not only counts but it's also more efficient than haphazard disk stuffing. And if the disk-partitioning software that comes with the drive you select doesn't let you arrange file-storage areas just as you'd like, third-party partitioning software is easy to find.

Except for those of the pricey MicroNet SBT-1288NP, the technical

specs are almost identical across the entire range of gigadrives, although the Seagate/Imprimis-technology drives are slightly faster than the Micropolis drives. For the present, though, the difference is moot; today's Macs just don't have the horsepower to take advantage of all the performance any gigadrive may offer.

Once bought and installed, these drives are hard to tell apart. They're all fast, with relatively few differences among them. However, our job at MacUser Labs is to find those few differences, recognize the important ones, and help you decide which gigadrive will solve your individual colossal-storage problems (see the "Bottom Line" sidebar).

Writer and consultant H. B. J. Clifford is a former *InfoWorld* editor and coauthor of *DBXL and QuickSilver Programming: Beyond dBASE*. Stephen Satchell has filled a few gigabyte drives with code—including disk drivers—and one modest 150-megabyte drive with reviews and test procedures.

The Bottom Line

Gigadrives — hard drives that provide 1,000 megabytes of storage — are a godsend to desktop publishers, artists, multimedia developers, desktop-video and -audio producers, and users who must keep mountains of data on-line and available for analysis. Prices are surprisingly reasonable — especially on a dollar-per-megabyte basis — and the performance of all the gigadrives we tested was almost uniformly excellent. Although the Seagate-based drives proved slightly faster than their Micropolis-based counterparts, at the moment that difference is negligible.

The **MacTown DataStor HM1.2/15M** (\$2,699) drive is the street-price leader and ties for lowest list price. Although it has only a one-year warranty, it has a 30-day money-back guarantee to get it through that first crucial month of day-to-day use and abuse. Despite its bargain price, it ranked near the top in all our performance tests.

Tied with the DataStor HM1.2/15M for our top pick is the **MicroNet SB-1000NP** (\$5,995). Macs will get faster over the next few years, and farsighted buyers should consider this speedy gigadrive. It has the same NuPort NuBus SCSI accelerator as the high-speed, high-priced **MicroNet SBT-1288NP** (\$9,990) — which was, by far, the fastest drive we tested. The SB-1000NP has a formatted capacity of 987 megabytes, A/UX-compatible partitioning (with an Auto button that automatically creates six equal-sized Mac partitions on the drive), and a temperature-controlled fan to reduce operating noise.

If you're running A/UX, we recommend that you take a close look at the **MacLand Imprimis 1.2 Gigabyte** (\$2,899) — despite its misleading name (its formatted capacity is only 988 megabytes). The Imprimis 1.2 Gigabyte has A/UX-compatible hard partitioning and is the only drive we tested that comes with a formatter that runs under A/UX. Its two-year warranty is complemented by a 30-day money-back guarantee and 48-hour turnaround.

AppleShare users should put the **Storage Dimensions MacinStor 1020-S1** (\$6,799) on their shortlist. In addition to a formatted

capacity of 999 megabytes, a two-year warranty, an excellent manual, and guaranteed 48-hour replacement, the company offers software to ensure that all partitions mount properly under AppleShare.



Our top gigadrive picks: the MacTown DataStor HM1.2/15M (middle right) and MicroNet SB-1000NP (bottom). The MacLand Imprimis 1.2 Gigabyte (middle left) is a great choice for A/UX, the Storage Dimensions MacinStor 1020-S1 (far left) is ideal for an AppleShare server, and the MicroNet SBT-1288NP (top) is the gigadrive for you if you want to pay top dollar for top performance.

Table 2 Criteria

List price — The list price is the vendor's suggested retail price.

Street price — The street price is a typical actual price charged by dealers or mail-order companies during March 1991.

Actual capacity — The actual capacity of the unpartitioned hard-disk drive.

Average seek time — The theoretical average time required to move the read/write heads between all possible combinations of two cylinders (sets of tracks) on the disk. Lower numbers indicate better performance.

Average access time — The theoretical average time required to read a block of data from or write it to the drive. Lower numbers indicate better performance.

DiskBasher score — The amount of time, in seconds, that *MacUser's* DiskBasher benchmark application required to complete its series of disk operations. Lower numbers indicate better performance.

Mechanism — The manufacturer and model number of the mechanism used in the drive. Check with the drive vendor to see if the mechanism used varies.

SCSI-ID selector — The method used to set the SCSI ID for the drive.

SCSI termination — Whether the SCSI-bus terminator is inside the case or outside.

SCSI cable — The length and type of the SCSI cable supplied with the drive.

SCSI driver — The software that manages the SCSI hard drive.

System version supplied — The Mac System version provided.

Bundled — Commercial applications, utilities, shareware, or public-domain programs included with the drive, and software developed exclusively for the vendor's drives.

User-selectable interleave — Can you force an interleave value during formatting instead of making do with a default or

formatter-derived value?

IM-V partitioning — Is software provided for dividing the gigadrive into smaller units in the manner prescribed by Apple in *Inside Macintosh, Volume V*?

Password protection — Does the drive software provide a password for disabling access by others?





Data encryption — Can the drive software scramble the data so that others cannot access it, even with special tools?

Disk optimizer — Does the drive come with utility software for reorganizing your disk so that all files are in one piece instead of scattered (fragmented) all over your disk?

Backup — Does the drive come with utility software that copies hard-disk data to floppy disks or other media for safekeeping?

File recovery — Does the drive come with a utility that rescues deleted files or extracts files from a damaged disk?

Table 2: Features of Gigadrives

				
● = yes ○ = no	APS 1 Gig ★★★★	CMS PD1000S ★★★★	Deltaic Server 1G ★★★	FWB Hammer 1000 ★★★
List price	\$2,899	\$7,199	\$3,199	\$7,295
Street price	\$2,899	\$4,900	\$3,199	\$5,795
Pros	Inexpensive.	Encryption software. Recovery software.	Fastest Micropolis drive.	Data-encryption software. Expensive.
Cons	DIP-switch SCSI ID.	Low formatted capacity.	Lack of partitioning software.	Outdated partitioning software.
Specifications				
Actual capacity	988 MB	886 MB	990 MB	988 MB
Average seek time	15 ms	15 ms	15 ms	15 ms
Average access time	23 ms	24 ms	24 ms	23 ms
DiskBasher score	16.30 sec	17.10 sec	15.83 sec	15.45 sec
Technology				
Mechanism	Seagate ST41200NM	Micropolis 1598-15	Micropolis 1598-15	Seagate ST41200NM
SCSI-ID selector	DIP switch	button	button	button
SCSI termination	external plug	external plug	external plug	external plug
SCSI cable (length, type)	30-inch, 25/50-pin	36-inch, 25/50-pin	24-inch, 25/50-pin	18-inch, 25/50-pin
Software				
SCSI driver	Alliance Power Tools 1.13	CMS Utility 6.0.1	Deltaic 2.01	Hammer 1.4
System version supplied	6.0.7	6.0.7	6.0.4	6.0.5
Bundled	18 MB of shareware	Symantec Utilities	none	HDP 3.02
User-selectable interleave	○	●	○	●
IM-V partitioning	●	●	○	○
Password protection	●	●	○	●
Data encryption	○	●	○	●
Disk optimizer	○	●	○	○
Backup	○	●	○	○
File recovery	○	●	○	○
Case				
Indicator lights	access, power	access	access, power	access, power
Size (L x W x H, in.)	7 x 8 x 12	11.25 x 10 x 4.75	5.0 x 9.75 x 9.75	9.75 x 9.5 x 4.5
Weight	18 lb	7.6 lb	11 lb	11.5 lb
Company				
	APS 2900 S. 291 Hwy. Independence, MO 64057 (800) 233-7550 (816) 478-8300	CMS Enhancements, Inc. Apple Products Division 2722 Michelson Dr. Irvine, CA 92715 (714) 222-6000	Deltaic Systems 1401 Junction Ct., #302B San Jose, CA 95122 (800) 745-1240 (408) 441-1240	FWB, Inc. 2040 Polk St., Ste. 215 San Francisco, CA 94109 (415) 474-8055

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Table 2: Features of Gigadrives, continued

				
● = yes ○ = no	HDI PowerDrive 1050EMC ★★★★	La Cie 1000MB ZFP Plus ★★★★	MacLand Imprimis 1.2 Gigabyte ★★★★	MacProducts Magic 1.2 Gig HD ★★★★
List price	\$2,699	\$4,549	\$2,899	\$2,795
Street price	\$2,699	\$4,000	\$2,899	\$2,795
Pros	Price leader.	Data-encryption and -recovery software. Two-year warranty.	Inexpensive. Two-year warranty. 30-day guarantee.	Inexpensive.
Cons	Internally terminated. Slowest drive.	Internally terminated. Outdated partitioning software.	Internally terminated.	72-hour repair turnaround.
Specifications				
Actual capacity	990 MB	988 MB	988 MB	988 MB
Average seek time	15 ms	15 ms	15 ms	15 ms
Average access time	24 ms	23 ms	23 ms	23 ms
DiskBasher score	17.82 sec	15.35 sec	16.06 sec	15.31 sec
Technology				
Mechanism	Micropolis 1598-15	Seagate ST41200NM	Seagate ST41200NM	Seagate ST41200NM
SCSI-ID selector	button, software	button	button	button, software
SCSI termination	internal	internal	internal	external plug
SCSI cable (length, type)	24-inch, 25/50-pin	24-inch, 25/50-pin	12-inch, 25/50-pin	36-inch, 25/50-pin
Software				
SCSI driver	Disk Manager Mac 2.23	Silverlining 5.27	Formatter Two 3.27	Disk Manager Mac 2.23
System version supplied	6.0.5	6.0.5	6.0.5	6.0.5
Bundled	none	Norton Utilities (except optimizer)	A/UX formatter	10 MB of shareware
User-selectable interleave	●	●	●	●
IM-V partitioning	●	○	●	●
Password protection	●	●	○	●
Data encryption	○	●	○	○
Disk optimizer	○	○	○	○
Backup	○	○	●	●
File recovery	○	●	○	○
Case				
Indicator lights	access, power	access, power	access, power	access, power
Size (L x W x H, in.)	7.75 x 9.75 x 4.25	9.75 x 9.75 x 4.75	10 x 9.5 x 3.75	10.75 x 10.25 x 3.25
Weight	14 lb	12 lb	11.5 lb	11.3 lb
Company	Hard Drives International 1912 W. Fourth St. Tempe, AZ 85281 (800) 767-3475 (602) 350-1128	La Cie Ltd. A Plus Development Co. 19552 S.W. 90th Ct. Tualatin, OR 97062 (800) 999-0143 (503) 691-0771	MacLand 4685 S. Ash Ave., Ste. H-5 Tempe, AZ 85282 (800) 333-3353 (602) 820-5802	Mac Products USA 8303 Mopac, Ste. 218 Austin, TX 78759 (800) 622-3475 (512) 343-9441



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Table 2: Features of Gigadrives, continued

				
● = yes ○ = no	MacTel HD Index Gigabyte \$\$\$\$	MacTown DataStor HM1.2/15M \$\$\$\$½	MicroNet SB-1000NP \$\$\$\$½	MicroNet SBT-1288NP \$\$\$\$½
List price	\$2,899	\$2,699	\$5,995	\$9,990
Street price	\$2,899	\$2,399	\$4,000	\$6,000
Pros	Inexpensive. Encryption software.	Fast. Price leader.	NuPort card. Temperature-controlled fan.	Fastest by far. NuPort card. Temperature-controlled fan.
Cons		Internally terminated.		Expensive.
Specifications				
Actual capacity	988 MB	990 MB	987 MB	1,266 MB
Average seek time	15 ms	15 ms	15 ms	13 ms
Average access time	23 ms	23 ms	23 ms	19 ms
DiskBasher score	15.92 sec	15.24 sec	14.72 sec	11.37 sec
Technology				
Mechanism	Seagate ST41200NM	Seagate ST41200NM	Seagate ST41200NM	Seagate Wren-Runner 2 (pair)
SCSI-ID selector	button	button	button	button
SCSI termination	external plug	internal	external plug	external plug
SCSI cable (length, type)	30-inch, 25/50-pin	24-inch, 25/50-pin	72-inch, SCSI-2-50/SCSI-1-50-pin	72-inch, SCSI-2-50/SCSI-1-50-pin
Software				
SCSI driver	HD Chauffeur 1.3	StorageWare 1.3b13	MicroNet Utility 5.0.3	MicroNet Utility 5.0.3
System version supplied	6.0.5	6.0.4	6.0.7	6.0.7
Bundled	20 MB of shareware	none	none	none
User-selectable interleave	●	●	●	●
IM-V partitioning	●	●	●	●
Password protection	●	○	●	●
Data encryption	●	○	○	○
Disk optimizer	○	○	○	○
Backup	●	●	●	●
File recovery	○	○	○	○
Case				
Indicator lights	access, power	access, power	access, power	access, power
Size (L x W x H, in.)	9.75 x 4.25 x 4	10 x 9.75 x 4	12 x 7.75 x 6.5	12 x 7.75 x 10
Weight	13 lb	11.1 lb	11.2 lb	15.7 lb
Company				
	MacTel Technology 3007 N. Lamar Austin, TX 78705 (800) 950-8411 (512) 451-2600	MacTown 4657 MacArthur Ln. Boulder, CO 80303 (800) 338-4273	MicroNet Technology, Inc. 20 Mason Irvine, CA 92718 (714) 837-6033	MicroNet Technology, Inc. 20 Mason Irvine, CA 92718 (714) 837-6033

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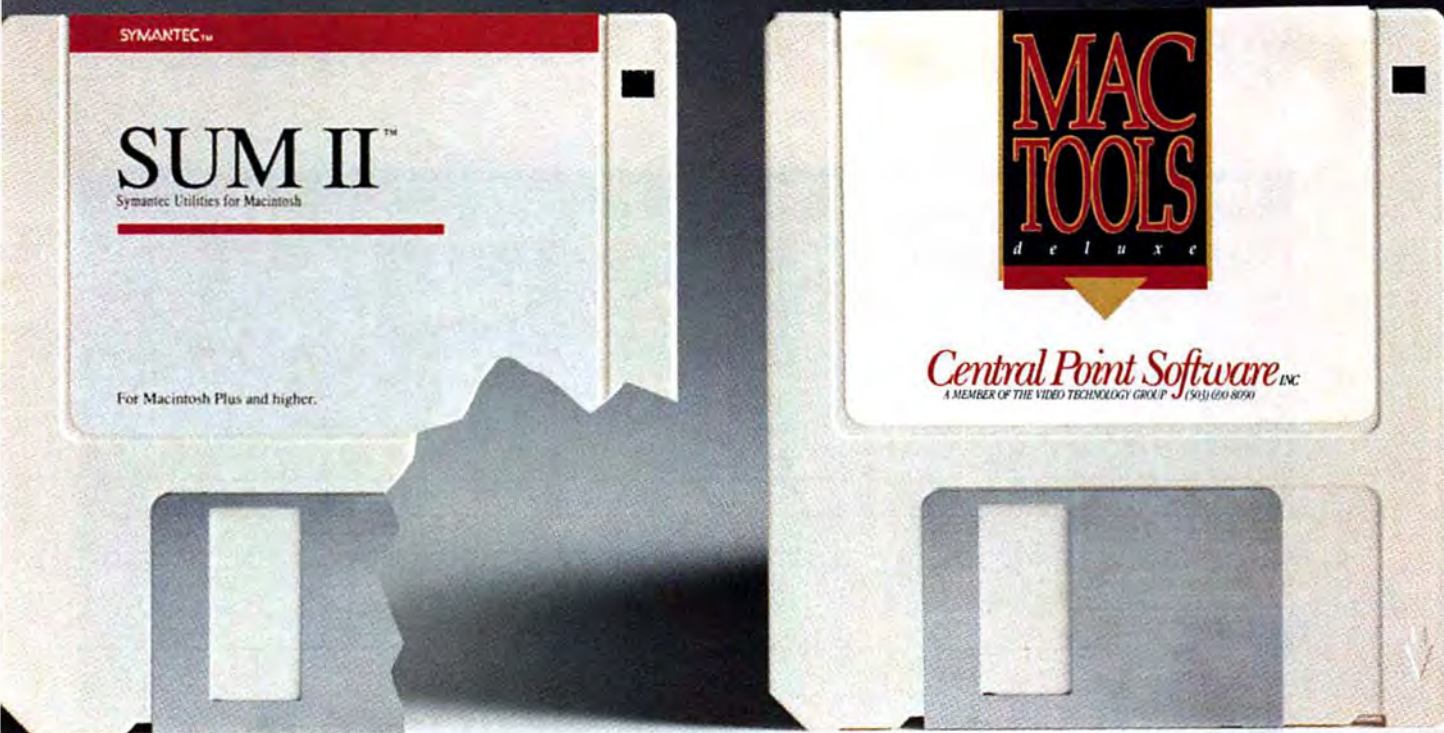
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Please circle 172 on reader service card.

Table 2: Features of Gigadrives, continued

				
● = yes ○ = no	Microtech MicroKCN N1000 ★★★★	Optima Concorde 1050 ★★★★	PLI PL 1.2 Gig ★★★★	Relax Hard Plus 1.0 Gig ★★★★½
List price	\$4,599	\$5,995	\$4,999	\$2,999
Street price	\$3,094	\$4,500	\$3,700	\$2,649
Pros	Five-year warranty Recovery and optimizer software.	Recovery software. Two-year warranty.	Optimizer software. Switched internal termination.	Inexpensive. Encryption software.
Cons	Internally terminated. Slowest Seagate drive.	Expensive.	No auto-switching power supply.	Format scheme provides fewer spare sectors than others.
Specifications				
Actual capacity	988 MB	988 MB	990 MB	1,000 MB
Average seek time	15 ms	15 ms	15 ms	15 ms
Average access time	23 ms	23 ms	23 ms	23 ms
DiskBasher score	16.95 sec	15.32 sec	16.00 sec	16.44 sec
Technology				
Mechanism	Seagate ST41200NM	Seagate ST41200NM	Seagate ST41200NM	Seagate ST41200NM
SCSI-ID selector	button	button	dial	button
SCSI termination	internal	external plug	external DIP switches	external plug
SCSI cable (length, type)	24-inch, 25/50-pin	60-inch, 25/50-pin	18-inch, 25/50-pin	24-inch, 25/50-pin
Software				
SCSI driver	Microtech HDF 3.27	DiskInit 2.1	PLI Formatter 3.0	Relax 1.10*
System version supplied	6.0.5	6.0.7	6.0.5	6.0.5
Bundled	none	none	PLI Turbo Utilities	none
User-selectable interleave	●	●	●	●
IM-V partitioning	●	●	●	●
Password protection	○	●	○	●
Data encryption	○	○	○	●
Disk optimizer	●	○	●	○
Backup	●	○	●	●
File recovery	●	●	○	○
Case				
Indicator lights	access, power	access, power, term power	access	access, power
Size (L x W x H, in.)	11 x 11 x 4	4.25 x 11.5 x 10.25	11.5 x 9.5 x 4.75	10.75 x 10.25 x 3.75
Weight	14.7 lb	13 lb	9 lb	20 lb
Company	Microtech International, Inc. 158 Commerce St. East Haven, CT 06512 (800) 626-4276 (203) 468-6223	Optima Technology Corp. 1752G Von Karman Irvine, CA 92714 (714) 476-0515	Peripheral Land, Inc. 47421 Bayside Pkwy. Fremont, CA 94538 (800) 288-8754 (415) 657-2211	Relax Technology, Inc. 3101 Whipple Rd. Union City, CA 94587 (415) 471-6112

*The Diversified I/O 2.01 SCSI Driver, necessary for partitioning, is available at extra cost (\$59).



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x	x	x	Multiple Setup Files
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Table 2: Features of Gigadrives, continued

			
● = yes ○ = no	Rodime Cobra 1000e ★★★★½	Storage Dimensions MacinStor 1020-S1 ★★★★	Tulin A-Hive Hard Drive ★★★★
List price	\$8,899	\$6,799	\$3,419
Street price	\$6,299	\$4,500	\$3,419
Pros	Encryption software. Two-year warranty.	Recovery software. Two-year warranty.	SCSI-cabling option.
Cons	Expensive. Internally terminated. DIP-switch SCSI ID.		DIP-switch SCSI ID.
Specifications			
Actual capacity	990 MB	999 MB	990 MB
Average seek time	15 ms	15 ms	15 ms
Average access time	23 ms	23 ms	24 ms
DiskBasher score	15.57 sec	15.63 sec	17.49 sec
Technology			
Mechanism	Seagate ST41200NM	Seagate ST41200NM	Micropolis 1598-15
SCSI-ID selector	DIP switch	dial	DIP switch
SCSI termination	internal	external plug	external plug
SCSI cable (length, type)	24-inch, 25/50-pin	30-inch, 25/50-pin	36- or 72-inch, 25/50-pin
Software			
SCSI driver	Cobra 1.1.3	MacinStor 3.0	DataWare 1.3b13
System version supplied	6.0.7	6.0.5	6.0.5
Bundled	Redux	MacTools Deluxe	none
User-selectable interleave	●	●	●
IM-V partitioning	●	●	●
Password protection	●	●	○
Data encryption	●	○	○
Disk optimizer	○	●	○
Backup	●	●	○
File recovery	○	●	○
Case			
Indicator lights	access, power	access, power	access, power
Size (L x W x H, in.)	14.5 x 7 x 4	14.5 x 7.5 x 5.75	10 x 9.5 x 4.25
Weight	13 lb	12 lb	16 lb
Company	Rodime Systems, Inc. 901 Broken Sound Pkwy. N.W. Boca Raton, FL 33487 (800) 688-9390 (407) 994-5585	Storage Dimensions 2145 Hamilton Ave. San Jose, CA 95125 (408) 879-0300	Tulin Corp. 2156H O'Toole Ave. San Jose, CA 95131 (408) 432-9025

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To upgrade a 4-socket Mac Plus or SE to this amount of memory.	Do this: (Install in multiples of two only)
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2-1/2 MB	Remove only two 256K SIMMS, install two 1 MB SIMMS.
4 MB	Replace all four 256K SIMMS with four 1 MB SIMMS.
To upgrade an 8-socket Mac II, IIx, IIcx, or SE 30 to this amount of memory.	Do this: (Install in multiples of four only.)
4 MB	Remove all four existing 256K SIMMS, install four 1 MB SIMMS, leave remaining sockets for future expansion.
5 MB	Keep existing 256K SIMMS, install four 1 MB in remaining sockets.
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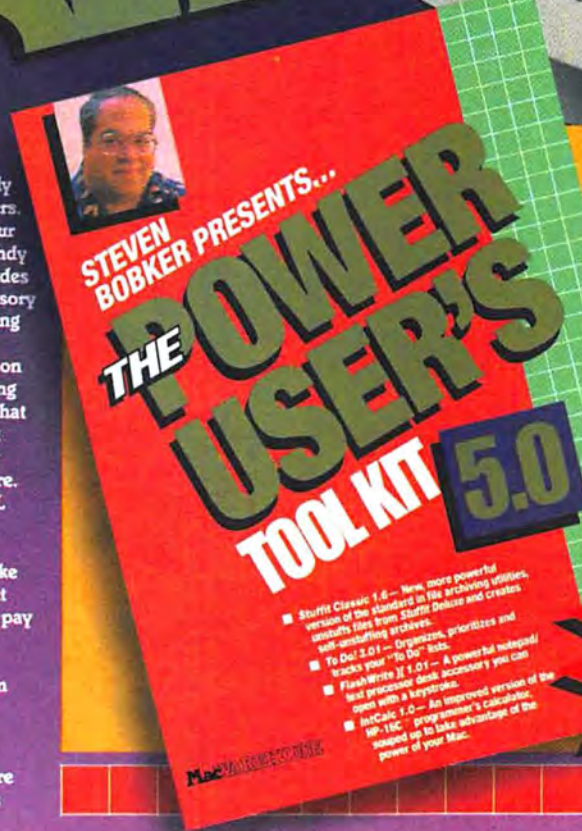
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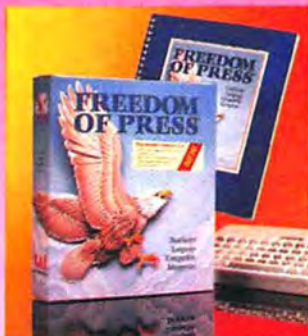


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COM0008	Membership Kit	22
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COM0052	MacLink Plus / Translators 5.0	109
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NET0122	Timbuktu® 4.0	136
NET0034	Timbuktu Remote® 2.0	135

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NET0091	SE/30	359
NET0090	Nubus 10-pack	3259

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Hayes		
COM0015	Smartcom II 3.2	84

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UTI0174	AccessPC	65
COM0063	Soft PC AT/EGA Module	125
COM0045	SoftPC 1.3	245
COM0091	SoftPC 2.0 for Mac Classic & LC	139

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NET0097	DataClub - 3 Pack	269
NET0098	DataClub - 10 Pack	539

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NET0088	Carbon Copy Mac - twin	189

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COM0056	Prodigy Starter Kit for the Mac	27

Sitka		
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NET0049	MACTOPS 3.0	187

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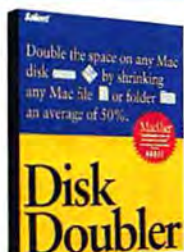
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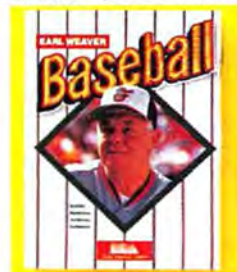
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GRA0268	Kid Pix	29

Davidson & Associates

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EDU0108	Desktop Help for Excel	52
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ENT0346	Bane of the Cosmic Forge	35
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ENT0278	Life & Death	32
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GRA0187	UltraPaint	125

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GRA0105	Cliptures Vol 1 Business Images	69
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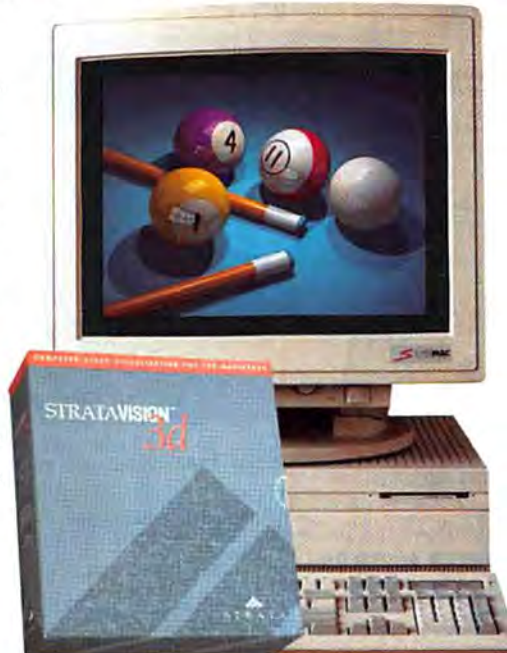
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Strata		
GRA0176	StrataVision 3D 2.0	349.
Strategic Mapping, Inc.		
GRA0227	Atlas MapMaker 4.5	369.
SuperMac		
GRA0253	PixelPaint 2.1	162.
GRA0249	PixelPaint Professional 2.0	519.
T/Maker Co.		
GRA0209	ClickArt Business Cartoon	33.

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NP0126	MacTRAC ADB	75.

Meeting Maker (ON Technology, Inc.)

A Macintosh network application that helps you plan, schedule and confirm meetings. You can schedule a time and date, select required guests, reserve rooms and resources and prepare agendas. Meeting Maker also has a personal calendar that allows you to block out activities, meetings, private work sessions, even recurring weekly or monthly appointments in a single step. You can also print your calendar in popular day-planner formats. **5-User BUS 0165 \$299.; 10-User BUS 0166 \$559.**

Flash (Beagle Brothers)

Want to get your files across the network in a flash? Beagle Brother's Flash is a fun file transfer utility for anyone on an AppleTalk network. Forget dedicated file servers - Flash moves across your network quickly, easily, and reliably. Flash is simple to use - just drop files into folders. And because it works in the background, you can work while Flash transfers your files. You can even chat with other users in real time! **NET 0060 \$129.**



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INP0162	TrueLaser Printer	2019.
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INP0084	The UnMouse	189.
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ACC0535	Power Key	64.

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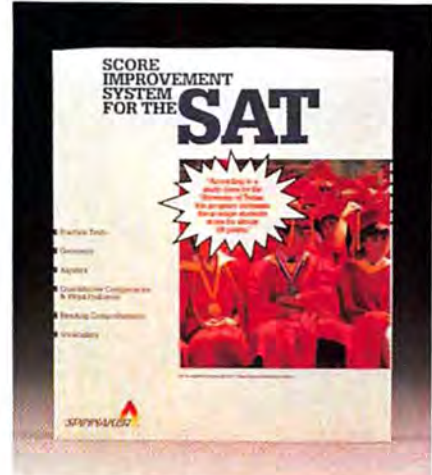
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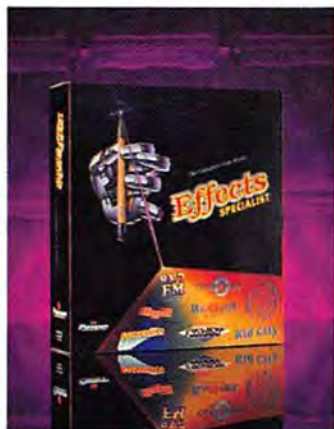
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DESKTOP PUBLISHING

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By Aileen Abernathy

Aldus resurfaces: The creator of desktop publishing has been lying low of late, licking its wounds from the unexpectedly harsh criticisms of PageMaker 4.0 and the newfound strength of archrival Quark. Now Aldus is trying to regain lost ground with Aldus Additions (see last month's column) and a major upgrade to PrePrint. ♦ Aldus is repositioning PrePrint 1.5 as a stand-alone program that can separate all "color-conforming" PostScript files — those that respect Adobe's conventions for document structuring and color separation. So far, it works with PageMaker, FreeHand, Photoshop, and Illustrator — but not QuarkXPress. Among the dozens of new or improved PrePrint features are the ability to color-separate an arbitrary page range, output of separations in page order rather than color by color, font downloading, support for EPS and DCS, and image resampling. ETA: summer '91. ♦ The recently released PageMaker 4.01 supports PrePrint 1.5's new features, fixes bugs, and is significantly faster during launch and for placing text files. ♦ In a glimpse of *other* things to come, Aldus president, Paul Brainerd, recently told *Applicando*, an Italian Mac magazine, that Aldus plans to split PageMaker into two versions, one for professional publishers and one for the business market. Aldus wouldn't confirm this report, but it didn't deny it either.



Meanwhile, Quark is solidifying its lead in the high-end-publishing market. Version 3.1 of QuarkXPress, due out this fall, eliminates the separate Data file and adds three new palettes (Colors, Trap Info, and Style Sheets). The Colors palette lets you make linear PostScript blends, and it supports the Focoltone and TruMatch color systems (in addition to Pantone). QuarkXPress 3.1 will also be System 7.0-friendly, incorporating balloon help and publish-and-subscribe. The real shocker: QuarkXPress will *not* support TrueType. Bad move, Quark. QuarkXPress' price will jump \$100, to \$895.

Fonts galore: Adobe has jumped on the type-CD-ROM bandwagon with Type On Call, a disc that holds the entire Adobe typeface library (950+ faces), including the Adobe Originals series. For \$99, you get ATM plus two typeface families. The remaining faces are locked away until you call Adobe or your dealer and trade your credit-card number for the access codes. A novel twist: You can purchase individual faces (such as Bodoni Poster) instead of just families for \$50 each. ♦ Agfa Compugraphic has released version 2.1 of its AgfaType CD-ROM, which contains 1,650 Type 1 fonts — the complete Agfa and Adobe type libraries, including 126 symbol and Pi fonts — plus five type-related programs. Introductory pricing (with 20 unlocked display fonts) is \$99 for the disc alone or \$695 if it's bundled with a Toshiba CD-ROM drive (the normal retail price is \$1,920). 🖱



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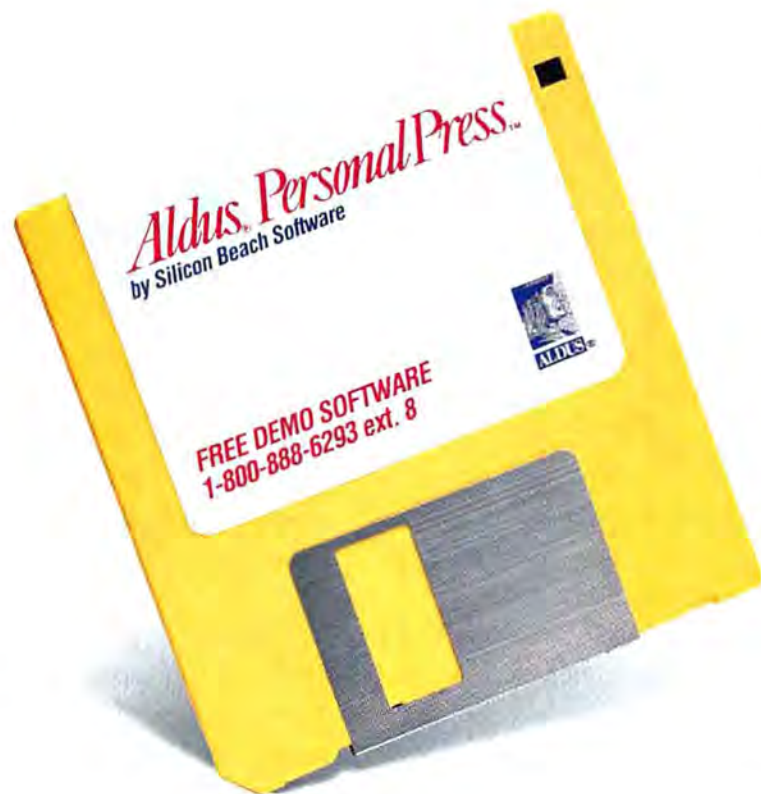


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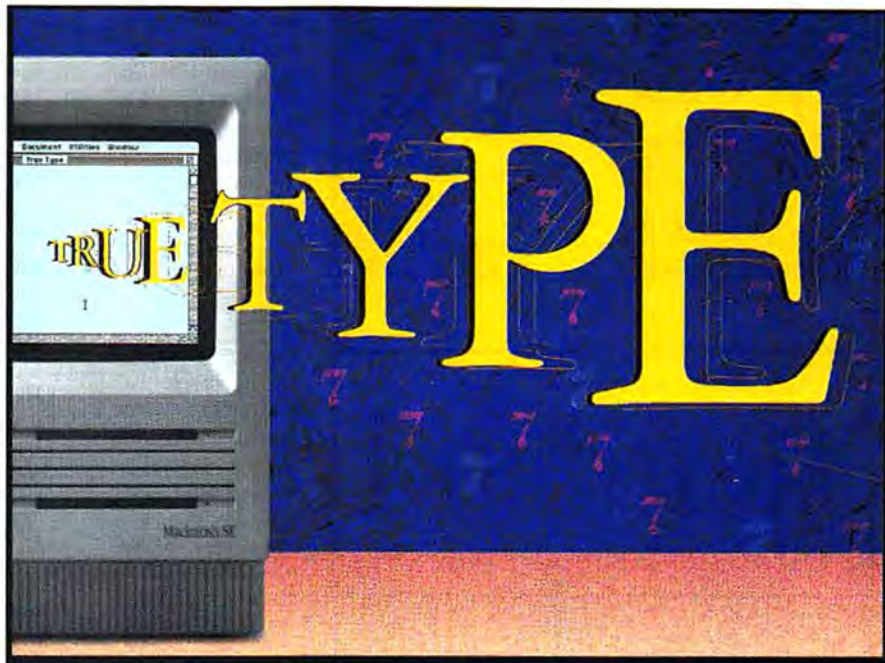
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TrueType Arrives

Apple Computer's much-ballyhooed TrueType technology has finally shipped, and font vendors are scrambling to release TrueType fonts and type-conversion tools.

By Aileen Abernathy



At long last, TrueType. We've been hearing about Apple's new outline-font technology for nearly two years as a key component of System 7.0. Apple suddenly unbundled TrueType from System 7.0 last March when it unveiled its low-cost printers, the StyleWriter and the Personal LaserWriter LS. TrueType is now available in two ways: as an integral part of System 7.0 and as a separate INIT for System 6.0.7 users, who can obtain it free from user groups and on-line services. (For more on the new Apple printers and some early TrueType speed and compatibility tests as well as type samples, see "Personal Best: Two New Apple Printers," May '91, page 90).

The release of TrueType raises the type-quality baseline for nearly every Mac user. It will be built in to every Mac shipped with System 7.0, making jagged-looking type almost a thing of the past. TrueType offers many of the same benefits as ATM (Adobe Type Manager) and PostScript Type 1 fonts: scalable, high-quality type, both on-screen and on paper. Indeed, *MacUser's* first looks at TrueType fonts reveal them to be almost indistinguishable in quality from Type 1 faces, although slight differences in character widths may affect line endings if you switch from a face in Type 1 format to its twin in TrueType.

TrueType fonts use a single outline-font file

for screen display and output rather than the separate screen (or bit-mapped) and printer (outline) fonts required for Type 1 fonts. Best of all, System 7.0 users no longer have to deal with the infamous Font/DA Mover. To install TrueType and bit-mapped fonts in System 7.0's System file, you just drag the fonts' icons over the System Folder icon — the fonts are then automatically installed in the System file. You can even see a type sample by double-clicking on the font icon; this is true even if the font is *in* the System file, because the System file behaves like a folder — you can open the file by double-clicking on it and see the individual bit-mapped and TrueType font-file icons. For those who prefer not to install the fonts in the System file, Suitcase II (version 1.2.9) supports TrueType. (MasterJuggler doesn't, and at press time, ALSoft hadn't announced its upgrade plans.)

The TrueType technology works with all printers, and TrueType fonts print at the maximum resolution of TrueImage, PostScript, and QuickDraw printers. Some third-party printers, such as Hewlett-Packard's popular DeskWriter, are already TrueType-compatible. Other printer manufacturers should have TrueType drivers for their printers by the time you read this (or shortly thereafter).

Apple provides eight TrueType fonts with System 7.0 — Times, Helvetica, Courier, and



Figure 1: Bitstream was the first vendor to ship TrueType fonts, releasing Font Packs 1 and 2 for TrueType — each containing seven fonts for \$89 — the same week in March that Apple announced its new low-cost printers.



Figure 2: Bernhard Modern, part of Bitstream's Font Pack 2 for TrueType, is one of dozens of TrueType offerings now available. This sample was output at 300 dpi on a QMS-PS 820 Turbo laser printer.

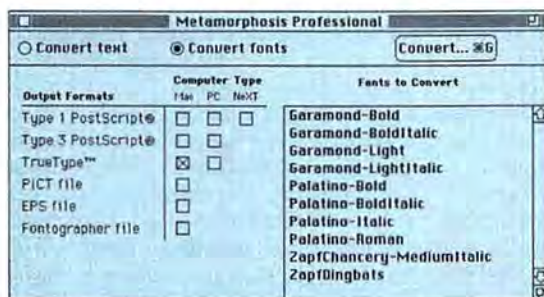


Figure 3: Metamorphosis Professional, from Altsys, can convert Type 1 fonts into TrueType format (and vice versa) for both the Mac and the PC. The program can also create editable PICT or EPS outlines from TrueType or Type 1 fonts.

Symbol, plus TrueType versions of Chicago, Geneva, Monaco, and New York — and type vendors have already announced hundreds of other TrueType fonts, some of which are already shipping. Other companies have released programs that let you convert fonts from Type 1 to TrueType format or even create TrueType fonts from scratch. Here's an overview of the TrueType offerings announced at press time (there are likely to be others by the time you read this).

Font Vendors

The major font vendors are busily converting their existing Type 1 libraries into TrueType format; a few are designing new faces exclusive to TrueType. Price tags for

TrueType faces are usually comparable with those for Type 1 offerings, and some packages (such as Bitstream's) are available through dealers or mail-order houses.

Bitstream was the first font vendor to ship TrueType fonts, releasing Font Packs 1 and 2 for TrueType (see Figure 1) the same week in March that Apple announced its new printers. Each \$89 package contains one text typeface in 4 styles and 3 display faces. Font Pack 1 contains the text face Amerigo, plus Stencil, Windsor, and American Text. Font Pack 2 includes Bernhard Modern (see Figure 2), along with Futura Black, Exotic Demi-Bold, and Embassy. In late spring, Bitstream will release Font Packs 3 and 4; these \$149 packages will contain 13 TrueType faces

each. By the end of 1991, Bitstream expects to have shipped more than 1,000 TrueType fonts. Bitstream provided Apple with two of its core TrueType fonts, Courier and Symbol, and its corporate typeface (Apple Garamond); it will also provide Apple with Japanese fonts in TrueType format (using designs from Ryobi Imagix) for future versions of Apple's KanjiTalk System software. Bitstream, 215 First Street, Cambridge, MA 02142; (800) 522-3668 or (617) 497-6222.

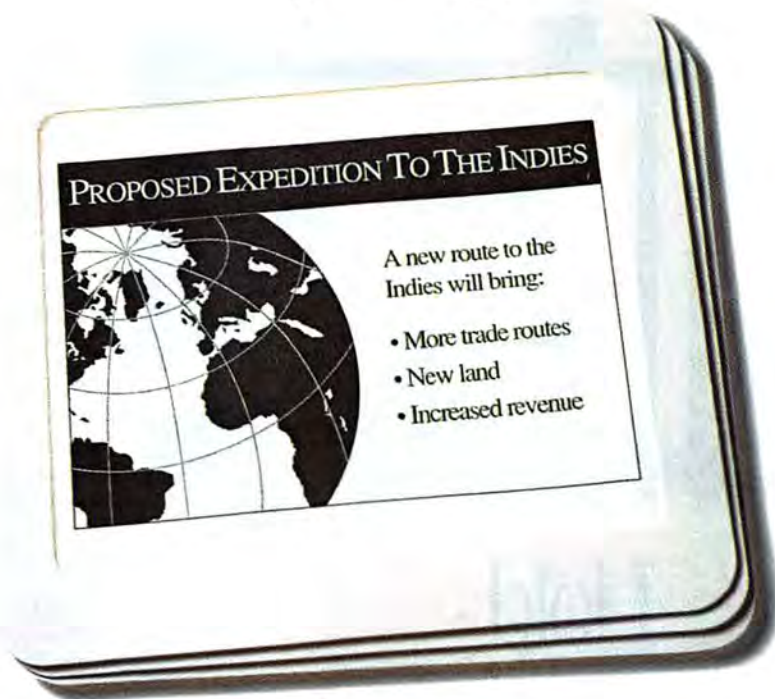
Linotype-Hell provided Apple with its other two core TrueType fonts, Helvetica and Times. The company's first commercial TrueType package, the Desktop Selection, retails for \$185 and contains 7 TrueType fonts: Centennial (55 and 56), Memphis (medium and extra bold), Helvetica Compressed, Present, and Antique Olive Compact. Linotype plans to release more TrueType versions of its 2,000-face collection before the end of 1991. Linotype-Hell Co., 425 Oser Avenue, Hauppauge, NY 11788; (800) 633-1900 or (516) 434-2000.

Monotype has a two-pronged approach to TrueType. Its Imprints series offers popular display faces in TrueType format, retailing for \$29.99 per face. Twenty designs were released in April — including Bodoni Ultra Bold, Gill Sans Light, and Photina Bold — and more than 100 faces should be out by midsummer. Monotype's Classic Fonts series of typeface families will also be available in TrueType format. Each package will contain 2 to 8 typefaces; a typical 4-face family should retail for less than \$175. Initial releases, due out in late spring, include Rockwell, Bembo, and Gill Sans, and Monotype should have more than 40 other faces shipping as you read this. Around 300 TrueType versions of Classic Fonts faces should ship by year's end. Monotype Typography, 53 W. Jackson Blvd., Suite 504, Chicago, IL 60604; (800) 666-6897 or (312) 855-1440.

Agfa Compugraphic calls its TrueType collection the Desktop Series. Each volume (\$99 and up) contains 1 typeface family in 4 styles (such as roman, italic, bold, and bold italic). The first releases include Garth Graphic and Shannon and should be available this summer. Agfa plans to have 200 TrueType faces available by the end of 1991. Desktop Series fonts will be included on version 3.0 of the AgfaType CD-ROM, which is due out in late summer; registered users will receive a free upgrade disc (for more on the CD-ROM, see this month's Desktop Publishing column). Agfa



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TYPE

Compugraphic, 90 Industrial Way, Wilmington, MA 01887; (800)424-8973.

Letraset has not been a serious player in the Mac font market to date, but now it's jumping in with both feet. The company will release 60 of its display faces — including Bordeaux Roman, University

Roman Bold, and FreeStyle Script — by late summer. Each disk will contain 1 face in TrueType as well as Type 1 formats; pricing will be \$39 per face. The company eventually hopes to convert the bulk of its 700+ display typefaces into TrueType and Type 1 formats. Letraset, 40 Eisenhower

Drive, Paramus, NJ 07653; (800) 524-0785 or (201) 845-6100.

Image Club Graphics will rerelease its Type 1 library of 600+ faces in TrueType format, possibly by midsummer. Individual TrueType faces will cost \$25, the same as their Type 1 brethren. The TrueType library will be added to a future version of the Art + Type Vendor CD-ROM, which holds Image Club's Type 1 library and 23 volumes of Digit-Art clip art. For the initial \$99 fee, you get 20 unlocked fonts and one clip-art package; as with Agfa's CD-ROM, additional fonts and clip-art packages are a phone call (and a credit-card number) away. No word yet on when its type-conversion program, Evolution, will be upgraded to handle TrueType/Type 1 switcheroos. Image Club Graphics, 1902 11th Street S.E., Suite 5, Calgary, Alberta T2G 3G2, Canada; (800) 661-9410 or (403) 262-8008.

Casady & Greene is offering the TrueType Starter Set, a collection of 22 TrueType fonts for \$99.95. The company will also bundle TrueType versions along with the Type 1 versions of its typefaces in an updated release of the Fluent Laser Fonts Library, a \$179.95 collection of 79 fonts that should appear in May. All future Fluent Laser Fonts packages will contain both TrueType and Type 1 versions of Casady & Greene's fonts. As an added fillip, the company is including the TrueType INIT in each package for the benefit of System 6.0.7 users. Casady & Greene, 22734 Portola Drive, Salinas, CA 93908; (800) 359-4920 or (408) 484-9228.

Kingsley/ATF has converted its ATF Classic Type package to TrueType format. The \$165 package contains TrueType and Type 1 versions of 4 display faces: Wedding Text, Bernhard Fashion, Thompson Quillsript, and Cleland Border. Registered users of the Type 1 version can receive the TrueType disk free of charge. Kingsley/ATF Type Corp., 2559-2 E. Broadway, Tucson, AZ 85716; (800) 289-8973 or (602) 325-5884.

Type-Handling Programs

For those who'd like to convert their existing Type 1 library to TrueType format, some companies offer Type-1-to-TrueType conversion utilities. (Whether the converted fonts will retain the quality of the original typefaces remains to be seen.) Or perhaps you want to try your hand at *creating* TrueType fonts — there are programs for that too.

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2.0 of Altsys' font-conversion utility, now with Professional appended to the title, does more—much more—than just create editable outlines of Type 1 fonts (see Figure 3). Meta Pro can convert Type 1 fonts into TrueType format (and vice versa) for both the Mac and the PC. It also converts Type 3 fonts, creates Type 1 fonts for NeXT machines, and produces font databases for use in Fontographer. Beyond that, the program can create editable PICT or EPS outlines from TrueType or Type 1 fonts, which can then be imported as graphics into either QuickDraw or PostScript drawing programs. \$149; upgrades, \$45. Altsys Corp., 269 W. Renner Road, Richardson, TX 75080; (214) 680-2060.

FontMonger. This new utility from Ares Software handles type conversions and transformations. It converts fonts in any direction among the Type 1, Type 3, and TrueType formats. You can turn type into Illustrator, EPS, or PICT files or turn EPS images into font characters instead. You can combine characters from different typefaces into a single font, and you can make a font with custom characters such as fractions and small caps. \$99.95. Ares Software Corp., P.O. Box 4667, Foster City, CA 94404; (415) 578-9090.

FontStudio. Version 2.0 of Letraset's font-creation and -editing application provides full support for TrueType. You can create a font from scratch, using the outline- and bit-mapped-font editors, or convert among Type 1, Type 3, and TrueType formats. FontStudio 2.0 lets you apply character hints automatically or manually, auto-trace scanned images, assign EPS artwork to keyboard characters, and anti-alias screen fonts in up to 256 grays or colors. And—shades of Adobe's new Multiple Master technology—FontStudio offers font interpolation; that is, it can create an intermediate font between two specified typefaces (the possibilities for ugly fonts are mind-boggling.) Because Altsys is not immediately upgrading Fontographer to support TrueType, FontStudio is likely to become a major venue for original TrueType fonts created by individual users. \$595; upgrades from version 1.0, \$99. (For more on FontStudio's capabilities, see review, September '90, page 76.) Letraset, 40 Eisenhower Drive, Paramus, NJ 07653; (800) 524-0785 or (201) 845-6100.

ATF Type Designer I. Version 1.2 of this relatively new type-creation program lets you design typefaces in either Type 1

or TrueType format (for the Mac or the PC with Windows) and can perform conversions between the two. The program's feature set includes the ability to generate fonts with more than 256 characters; create composite characters; and output files in a wide variety of formats for the Mac,

IBM, NeXT, and Digital environments. \$549. Kingsley/ATF Type Corp., 2559-2 E. Broadway, Tucson, AZ 85716; (800) 289-8973 or (602) 325-5884. 

MacUser senior editor Aileen Abernathy has a true type personality.

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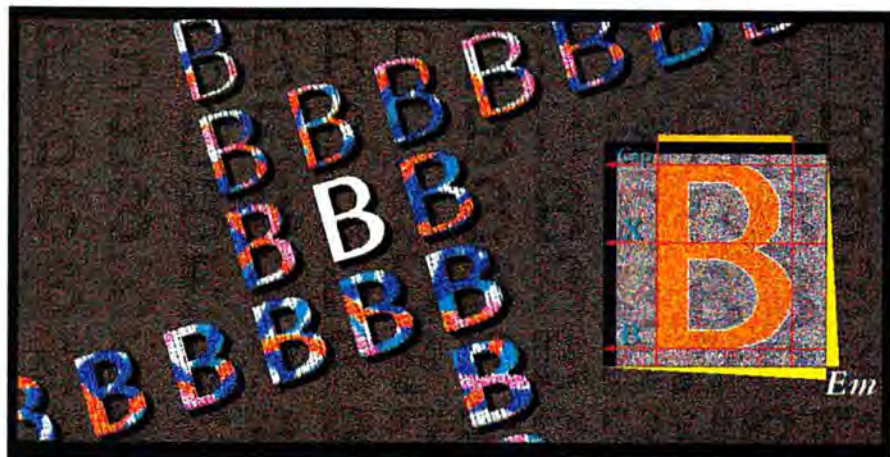
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The Future of Type?

Adobe's Multiple Master font technology may be the wave of the future. The benefits — on-the-fly font creation, better copyfitting, and improved readability at small sizes — bring new power to desktop typography.

By Henry Bortman



So Apple shipped TrueType at last, and you thought you finally had a leg up on Mac fontography. You didn't know exactly how, but somehow you'd figure out whether to stick with the Type 1 PostScript standard or make the switch to that shiny new TrueType stuff. Or maybe you'd be one of the clever, masochistic ones who managed to get the two font technologies to coexist peacefully — and to behave in expected ways. It might take some fancy fontwork, but at least you knew the rules of the game.

Wrong. Just days before Apple's surprise announcement of a TrueType INIT for System 6.x users — most of us thought we'd have to switch to System 7.0 to use TrueType — Adobe fired its own salvo in the seemingly endless battle of the font standards. Adobe stole much of Apple's TrueType thunder by announcing its Multiple Master font technology (Adobe will probably have a sexier name by shipping time).

Multiple Master fonts are an extension of Adobe's Type 1 specifications and use the ATM (Adobe Type Manager) rendering technology. Any one of the Multiple Master fonts (we'll call them multimaster fonts for short) can contain several sets of character outlines, or *master designs*, representing extremes of design elements such as weight and width. From these you can create — on the fly! — a wide variety of intermediate fonts, which are called *instances*.

The Design Axes

Before multimaster fonts, a Type 1 font contained a single set of character outlines. For example, a condensed font was contained in a

separate file from an extended font. With the multimaster technology, a single font can contain several sets of character outlines. For example, a single multimaster font file can contain a condensed set *and* an extended set of character outlines, enabling you to create fonts in a variety of intermediate widths.

Even without multimaster fonts, you can achieve something akin to condensed and extended type in several applications by applying varying amounts of horizontal scaling to a standard-width font. The results, however, send chills up the spine of any dyed-in-the-wool typographer. Stretching and squeezing type sacrifices one of the most crucial design elements: the proper ratio of horizontal and vertical strokes. In contrast, Adobe's multimaster fonts let you create a typographically accurate font anywhere on the continuum between condensed and extended (see Figure 1).

The *width* range defined by condensed on one end and extended on the other represents only one of the four axes along which you can create on-the-fly font variations with multimaster fonts. Multimaster fonts also support variations in *weight*, *style*, and *size*. Weight refers to the continuum between ultra-light and extra-black type — light, roman, bold, and heavy being some of the common intermediate points. The style axis can be used for just about anything: for example, a transition between a sans serif and a serif typeface or a roman and an italic one. The point-size axis brings a capability known as *optical scaling* to Type 1 fonts.

Optical scaling is an important concept that has so far been missing from digital typography. Character outlines that are designed to be

TYPE

readable and aesthetically pleasing at small point sizes generally look too bold at larger sizes (see Figure 2). Enter optical scaling. Simply put, it means that separate sets of character outlines are used for small and large point sizes, thus ensuring legible,

good-looking type at every size. Optical scaling is an integral part of traditional typography, and professional typographers have lamented its omission. Multimaster fonts achieve optical scaling by using the point-size axis — by providing, say, a 6-

point and a 24-point set of character outlines within the same font and interpolating between them.

How It Works

A single multimaster font can support one, two, three, or all four of the possible design axes. It's up to the typeface designer to decide how many variations to allow and to provide outlines for the appropriate control points in the matrix. A multimaster font that offered variation along the width and weight axes, for example, would probably contain four outlines: Light Condensed, Black Condensed, Light Expanded, and Black Expanded (see Figure 3).

The designer also decides how many discrete steps are possible along a particular axis and can assign names to subranges along the continuum. For example, a font called Sansifa might have a weight axis with 100 steps, with Ultra Light assigned to steps 1 through 10, Light assigned to 11 through 20, and so on, up to Extra Black, at steps 91 through 100. If you created an instance of Sansifa at step 14, it would appear on your Font menu as something like Sansifa 14Light.

Multimaster fonts will come with a predefined set of intermediate fonts, or instances. For example, if our mythical Sansifa font had both weight and width axes, it might come with a set of nine predefined instances: Light Condensed, Medium Condensed, Bold Condensed, Light, Medium, Bold, Light Expanded, Medium Expanded, and Bold Expanded. If you installed the Sansifa bit-mapped font into your system (or activated it with Suitcase), all nine of these fonts would appear on your Font menu. Adobe will provide a font-creation utility that will enable you to generate additional instances anywhere within the matrix (see Figure 4). Creating new instances will add more fonts to your Font menu.

You might be wondering where you're going to find the disk space to store these proliferating fonts. Not to worry. When you create new font instances, you aren't actually creating new fonts — you're only creating *pointers* to positions in the multiple-font matrix. It's like using a blend tool on fonts, but instead of creating all the intermediate steps at once, you create road signs that give directions on how to find them when you need them. These pointers are added to the bit-mapped font installed in your system. (For technical types: You're creating new FOND resources.)

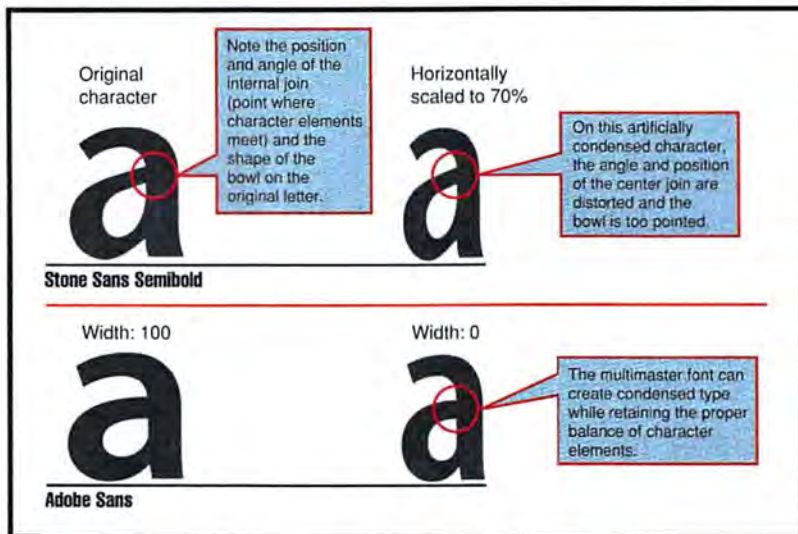


Figure 1: Type that's condensed by being squeezed horizontally doesn't retain the true character dimensions. In the top example, Stone Sans Semibold was horizontally scaled in Illustrator, causing distortions in stem weight and character shape. In contrast, the same characters maintain their design integrity when they are condensed in the Adobe Sans multimaster font (bottom).

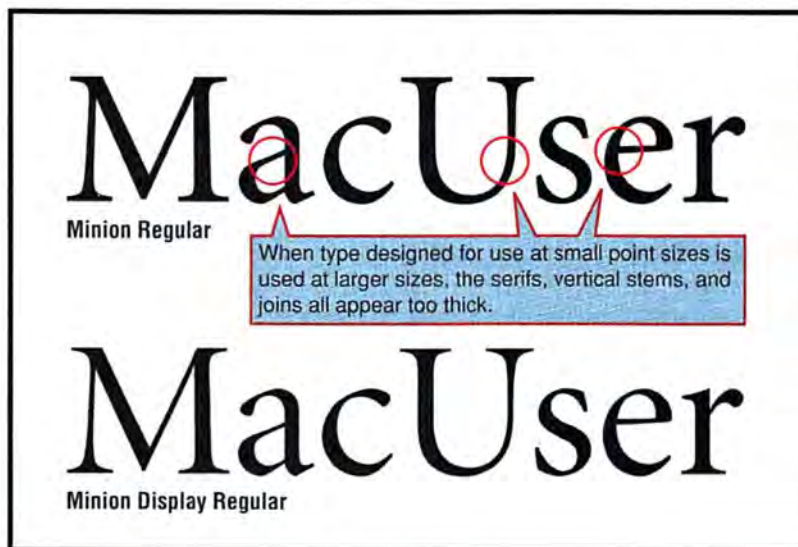


Figure 2: To ensure that type is readable and aesthetically pleasing at every size, separate sets of character outlines are sometimes used for small and large point sizes; the concept is called *optical scaling*. For example, Adobe's Minion Regular (top) is designed for use at small point sizes, whereas Minion Display Regular (bottom) is used at larger sizes. Both are shown here at 72 points. Note that the top sample has a slightly too-bold look. A multimaster font contains both sets of outlines in a single file and produces good-looking type at any size.

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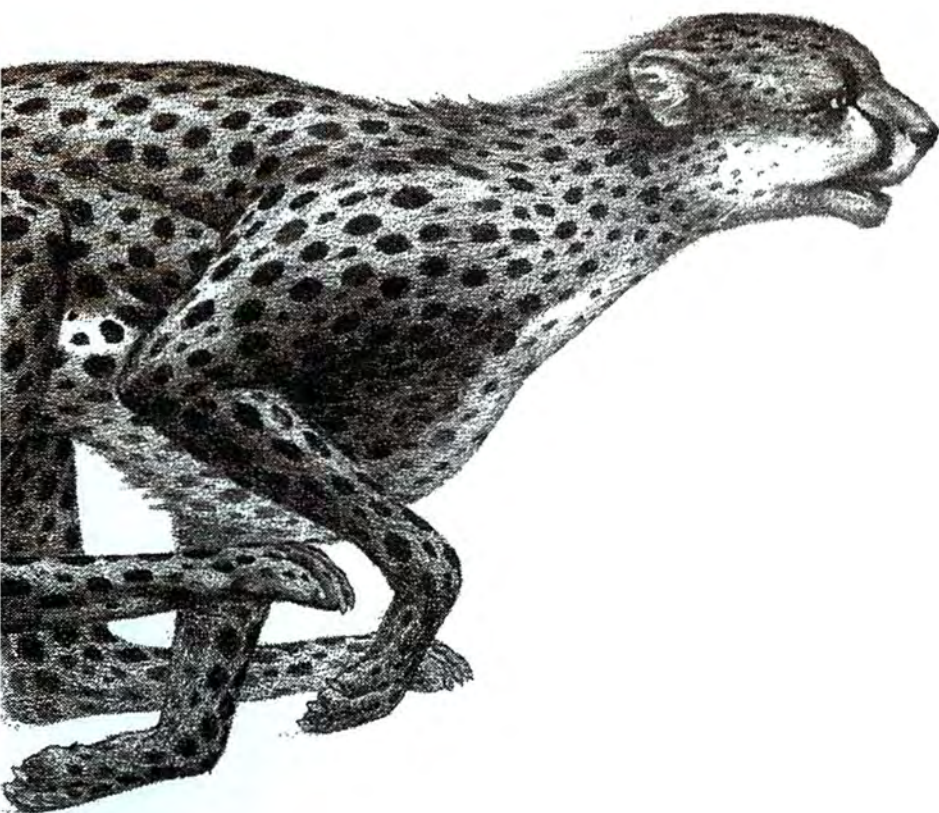
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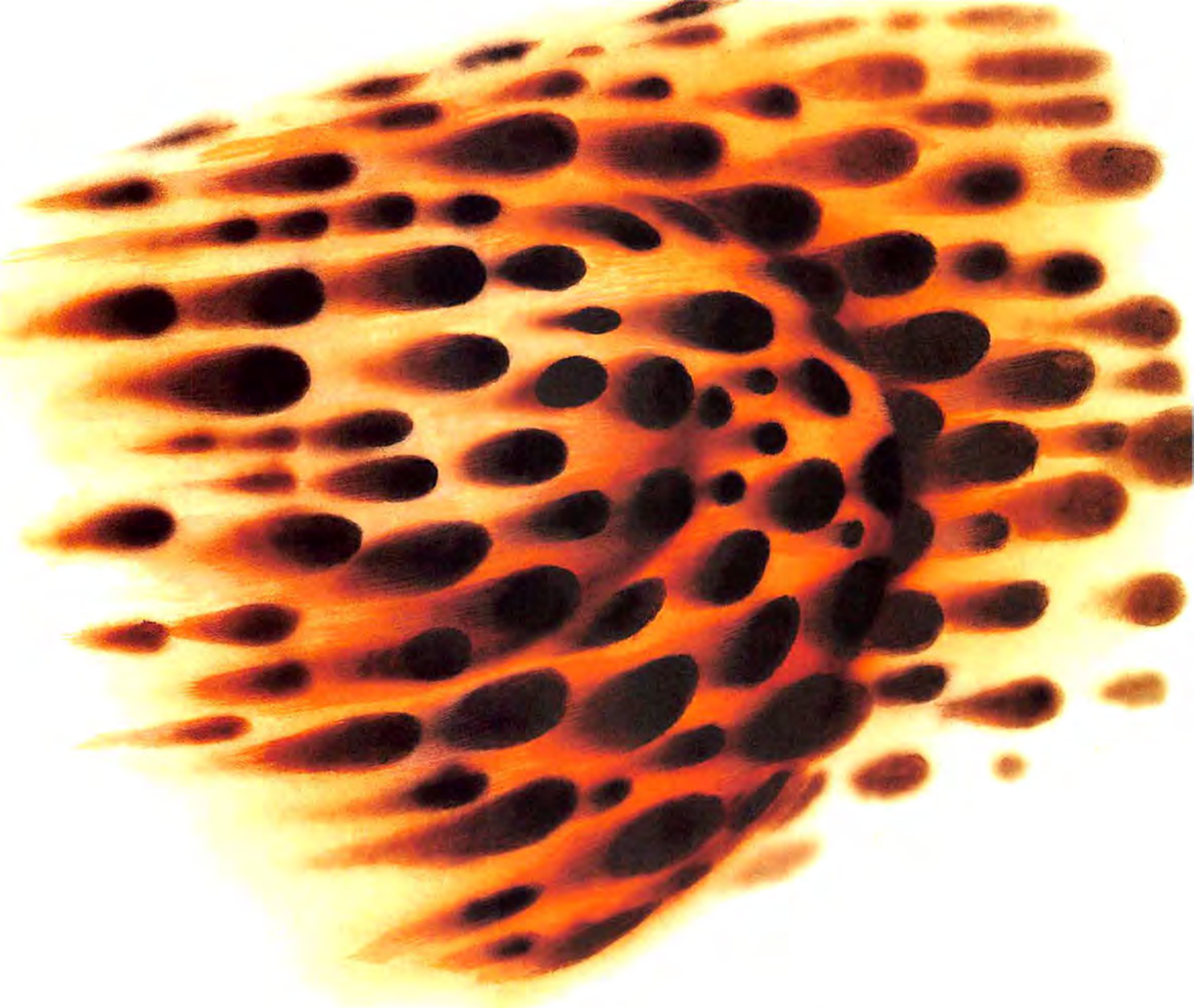
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Specifications

LZR 960 Controller Features

Page Description language	Memory
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	Host Interfaces AppleTalk/ LocalTalk/RS-422, RS-232, Centronic parallel

LZR 960 Engine Features

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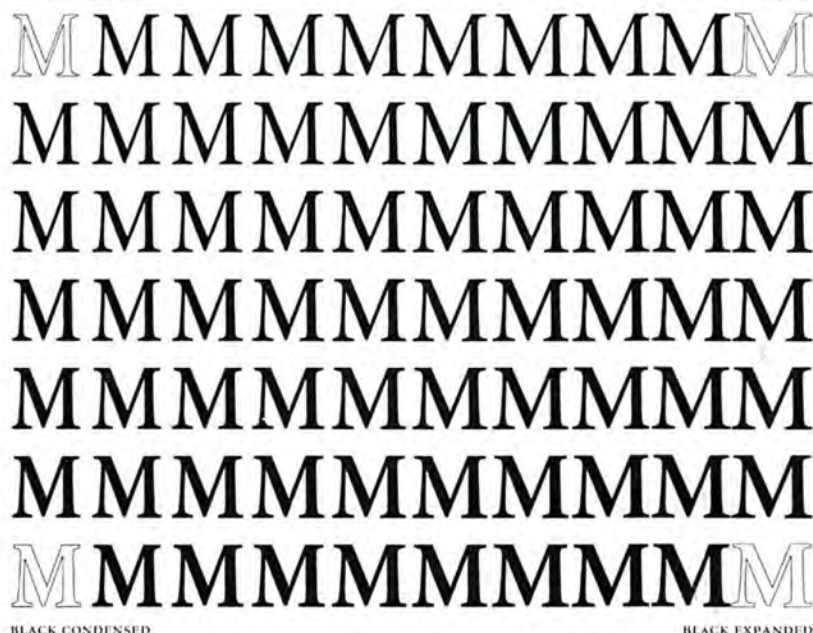


Figure 3: This design matrix, from a prerelease version of the Adobe Serif multimaster typeface, shows a variety of weights and widths. The four outlined characters at the corners of the matrix come directly from outlines in the multimaster font. All the other characters, or instances, are generated by interpolation between these outlines. This font also has a size axis (not shown).

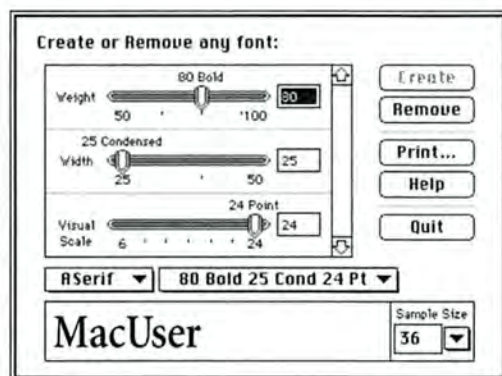


Figure 4a: Adobe will provide a font-creation tool for generating new instances of a multimaster font; the prototype at left shows the Adobe Serif font, with adjustable weight, width, and size (visual scale) axes.

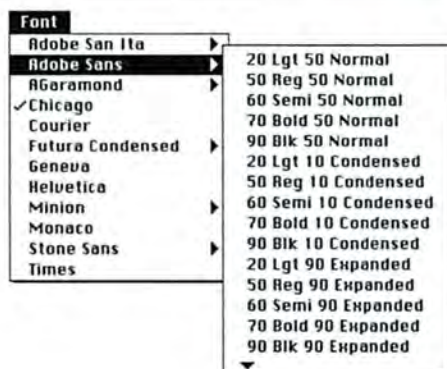


Figure 4b: The Font menu displays a demonstration set of the predefined font instances that will ship with the Adobe Sans multimaster font.

When you want to display multimaster type, ATM interprets the pointer, creates the necessary character outlines on the fly, and displays the appropriate dots on-screen. Likewise, ATM makes sure that at print time, the necessary PostScript command is sent to the printer so that it knows how to take advantage of any multimaster fonts that have been downloaded. And, by the way, you *do* need ATM for multimaster fonts to do their magic. They don't work properly without it — and don't look for Apple to incorporate support for multimaster technology in the Mac System anytime soon.

One question remains unanswered: How fast — or slowly — will it all work?

Who Will Use Them?

Multimaster fonts have enormous practical benefits, including better copyfitting and improved readability at every point size. By making subtle adjustments to a multimaster font's width, size, and/or weight, you can solve all manner of copyfitting nightmares. For example, you can expand or condense headlines and display copy to fit a given space while maintaining the typeface's size and weight; conversely, you can retain a font's width while tweaking the size or weight. These adjustments can work wonders with body copy too, allowing you (or your application) to fit text to a given column length; improve justification; and eliminate widows and orphans, text "rivers," and hyphenated lines. Optical scaling improves text legibility at small sizes and ensures well-balanced letterforms at large point sizes.

The early users of multimaster fonts will have to use a separate utility to generate new font instances, however, so the unique capabilities of this technology won't be appreciated by a wide audience at first. Designers and type nerds will be the ones who take the time to create custom fonts for specific design applications. Other users may like the convenience of getting a whole family of fonts in a single file, but they will probably be content to stick with the set of font instances provided by the vendor.

That's phase 1. Phase 2 will arrive once applications such as Illustrator, FreeHand, PageMaker, and QuarkXPress have begun to give users direct manual control over multimaster fonts instead of requiring them to leave the application to create new instances. Expect to see support for the optical-scaling feature first, because

TYPE

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Multiple Master Fonts

Because Multiple Master fonts can produce a wide range of typeface variations, they can precisely match the copyfit of a document created in an entirely different typeface, even though designs of the characters in the Multiple Masters font might have little in common with those of the font they're trying to match.

Multiple Master Fonts

Because Multiple Master fonts can produce a wide range of typeface variations, they can precisely match the copyfit of a document created in an entirely different typeface, even though designs of the characters in the Multiple Masters font might have little in common with those of the font they're trying to match.

Figure 5: Because multimaster fonts can match the character spacing and "color" of other typefaces, they will be a godsend for making font substitutions. In the top example, the headline is set in 18-point Avant Garde Bold Condensed and the paragraph in 10-point ITC Garamond Light. The bottom paragraph, which is set in instances of the Adobe Sans multimaster font, matches the line endings and character widths of both typefaces.

applications already have the interface for taking advantage of this capability: a point-size menu. Developers need only make their applications aware of the existence of multimaster fonts for optical scaling to work. ATM will do the rest.

This advance will be followed shortly by new dialog boxes that let users specify weight and width gradations for multimaster fonts as easily as they now specify a point size. Ideally, you will be able to move a slider in a type-spec dialog box, click on the Apply button, and watch the attributes of your selected type change on-screen. When it becomes this easy for users to take advantage of multimaster fonts, more people will exploit their full functionality.

Phase 3: The real fun will begin when applications develop intelligent support for multimaster fonts — such as automatically substituting a multimaster font for a missing typeface or altering font width or size to fit copy into a given space. Because multimaster fonts can produce a wide range of typeface variations, they can precisely match the copyfit of a document created in

an entirely different typeface, even though the characters in the multimaster font might have little in common with those of the font they're trying to match (see Figure 5). This could be very handy if someone sent you a document in a font you didn't have. Instead of your software reformatting the document and possibly destroying the original word positioning and line breaks, an application that made intelligent use of multimaster fonts could create a professional facsimile — right down to maintaining the text blocks' color or overall density. Once applications have become this smart, you will find yourself taking advantage of multimaster fonts without even knowing you're doing it.

Phase 4: Multimaster fonts will be incorporated into PostScript-printer controllers and drivers. Today when you print a document that was created with a typeface that isn't available at print time, another font is usually substituted — Times or Helvetica if you're lucky, Courier if you're not. You've all seen such documents. They're at their most entertaining when the person who created the original

lives 3,000 miles away and just went on vacation. You can wait for the designer's return, buy yourself a copy of the font used to create the document, or reformat the entire piece in a font you *do* have.

If printer controllers had built-in multimaster fonts, however, and applications and printer drivers had the smarts to direct the printer to use multimaster fonts when doing font substitutions, the resulting documents would satisfy user requirements in most cases.

Let's Get Real

Adobe says that it will release the first multimaster fonts this summer. (For the sun-worshippers among you, the last day of summer is September 20 — mark your calendars.) At press time, the company had announced plans to release a newly designed sans serif face with weight and width axes and a serif face based on Adobe's Minion designs, with width, weight, and size axes. Other typefaces are sure to follow, but Adobe isn't making any commitments yet.

Several font vendors — ITC, Linotype, Monotype, and Agfa — have expressed interest in the multimaster technology. They say they will study their type libraries to see which typeface families are appropriate for redesign as multimaster fonts and will ponder using the technology to create new typefaces. But none of the companies is ready to announce any specific product plans.


Nor were the vendors of page-layout and drawing applications prepared to make promises. Even Adobe was unwilling to provide a shipping date for a version of Illustrator with built-in controls for multimaster fonts. However, you can expect font-format-conversion programs such as FontMonger and Metamorphosis to add the capability to create multimaster fonts from existing PostScript Type 1 outlines. But don't expect written guarantees that the results will be pleasant — or even usable. For multimaster fonts to work properly, the component outlines have to be designed very carefully.

As for printer controllers with built-in multimaster fonts or intelligent drivers: Don't lose any sleep waiting to see them. Adobe would be happy to get PostScript Level 2 drivers and controllers out the door — with features it has already promised. The company's not exactly rushing to add new items to the vaporware list.

But don't despair: It may take years for all of this to happen, but happen it will.

This is the future of desktop typography.

... And wait — for a moment, I thought I saw someone in an Apple T-shirt lurking in the corner, arms crossed, lower lip sticking out just a little. I thought I heard him mumble, "I bet TrueType could do

that too." But he disappeared before I could ask any questions. 

MacUser technical director Henry Bortman thinks fonts are OK but wishes he had a multimaster brain.



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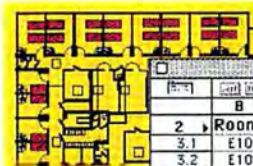
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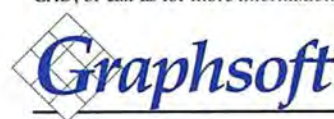
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3.2	E109	•	512.56	\$51	\$26272	
3.3	E115	✓	245.64	\$25	\$6034	
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By Henry Bortman



Data, anyone? Apple recently licensed its DAL (Data Access Language) technology to Blyth, maker of the Omnis 5 relational-database program. Blyth will develop DAL client software for DOS, Windows 3.0, OS/2, and UNIX machines. DAL is Apple's connectivity language, a programming interface that allows application developers to write a single set of instructions for connecting to and accessing data from a variety of relational databases — Oracle, Ingres, Sybase, DB2, and others — on many different mainframes and mini-computers. DAL is built in to System 7.0, but prior to the Apple/Blyth agreement, it could be used only from Macs, which limited its acceptance. * On the server side, Pacer will develop DAL server software for database programs running on several UNIX platforms, including HP 9000, Sun SPARC, IBM RS/6000, and DEC ULTRIX computers. Apple will also market two new DAL servers — one for A/UX, Apple's version of UNIX, and one for MVS/VTAM, an IBM-mainframe operating system. And Novell will develop DAL-server capability for its NetWare SQL database. In other words, DAL is well on its way to becoming an industry standard for flexible database connectivity. It's about time.

For those who want an easy way to query their databases, Brio's DataPrism is the easiest to use end-user query tool around. The newest version, 1.1, adds the ability to do local sorts and searches on large data sets retrieved from a database server. It also adds support for two database-connectivity options: Oracle's SQL*Connect and TechGnosis' SequeLink. \$345, with free upgrade to registered 1.0 users; available now. * In August, Brio will offer DataPivot, an Improv-like data-manipulation tool that lets you dynamically alter your view of data relationships and quickly format new reports. (415) 961-4110.

Crossing platforms? IPT's Sun-Partner has upped the interoperability ante for Macs and Sun SPARCstations. When installed on a SPARCstation, Partner lets Mac users access files on the SPARCstation's NFS server volumes as if they were AppleShare volumes and lets Sun users access AppleShare server volumes (and under System 7.0, FileShare volumes) as if they were NFS volumes. \$695 per SPARCstation, available soon. (818) 347-7791. * NeXT: innovative interface, short on software. DOS: scads of software, no interface (at least none worth mentioning). Solution: Run DOS applications on the NeXT. SoftPC 2.0 for NeXT (Insignia Solutions, [415] 694-7600) lets you do just that while you're waiting for all those NeXT applications Steve Jobs promised would be so quick and easy to develop. \$499. 





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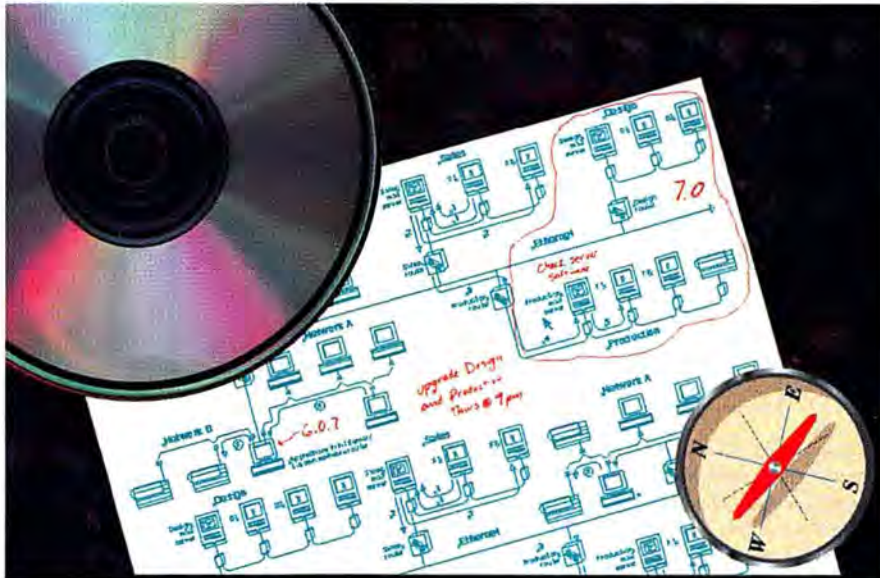


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System 7.0 on a Network

There are lots of tools for coordinating site installations of System 7.0—but most of the work comes before you run the Installer.

By John Rizzo



The network administrator's nightmare: System 7.0 ships, and everyone wants its cool new features *right now*. A few users get copies of System 7.0 from friends and install it themselves. Then something goes wrong, and a dozen people are at your desk seeking help and you don't know what they did or what was in their Mac when they did it. Other users are less well connected and want you to run around installing the new System on every Mac. Meanwhile, users of System 6.x and 7.0 battle each other for printer time, while everyone waits for the printers to reinitialize with different versions of the printer driver. There's *got* to be a better way to do an upgrade.

Fortunately, there is: Use the network. The transition to System 7.0 can be a smooth and quick one if you use the network-upgrade tools available from Apple and third parties. Apple's System 7.0 Group Upgrade Kit comes with a CD-ROM filled with goodies that ease installation frustrations. The kit lets users upgrade their own Systems over the network with a mouse click (see Figure 1).

Third-party network-management tools can save sneaker tread by telling you what each Mac needs in order to become System 7.0-ready. Unlike with previous System upgrades, however, much of the work will come before you run the Installer. (For a detailed look at System 7.0's new features, see "70 Things You Need to Know About System 7.0," June '91, page 96.)

The Group Upgrade Kit

The first thing you should do is buy Apple's System 7.0 Group Upgrade Kit. At \$349 (estimated price at press time), the kit is more expensive than getting a copy through your local user group, but it's worth its weight in shoe leather. The Group Upgrade Kit also comes with a site license that gives you the right to make copies and upgrade all the machines at your site.

In addition to the installation floppies that come with Apple's Personal Upgrade Kit, the Group Upgrade Kit gives you the System 7.0 Upgrade CD-ROM. You mount the CD-ROM on an AppleShare file server, and the Installer can then be used to upgrade multiple Macs at the same time, saving you the exercise of installing System 7.0 on each Mac individually. (For more on individual upgrades, see "Converting to System 7.0," elsewhere in this issue.)

If you want to give your users their own System-backup disks, the CD-ROM comes with a set of disk images and the Copy Disk application, which enable you to automatically create sets of installation floppies. The floppies you produce from the disk images are exact copies of the official Apple installation disks; they contain the Installer, System files, print drivers, and AppleShare, plus the usual extras (such as TeachText and Apple File Exchange). You can make installation sets of eight 800K floppies or five 1.4-megabyte floppies for everyone in the office. (The CD-ROM

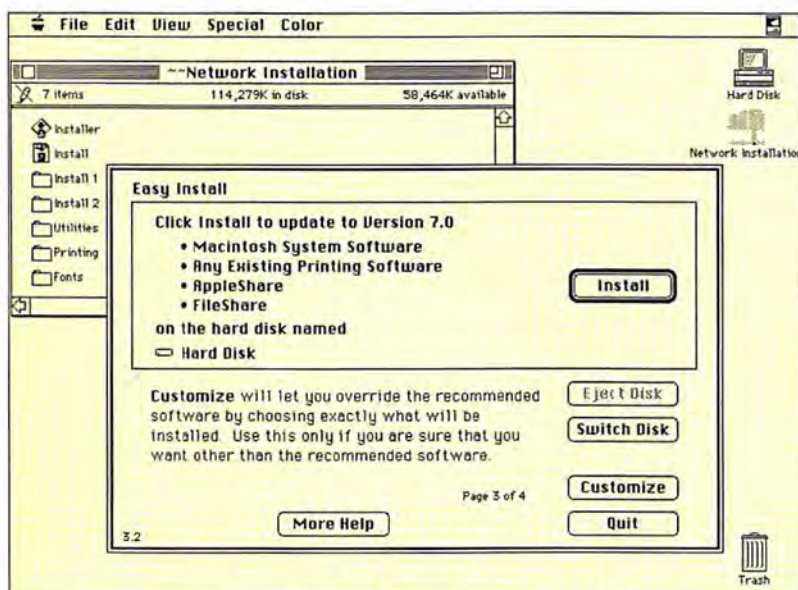


Figure 1: Users can install System 7.0 over a network with a mouse click. This user has mounted an AppleShare volume that contains the System 7.0 installation folders, which the network manager placed on the network by using System 7.0's built-in file-sharing capabilities. The new Installer can be accessed by several users simultaneously.

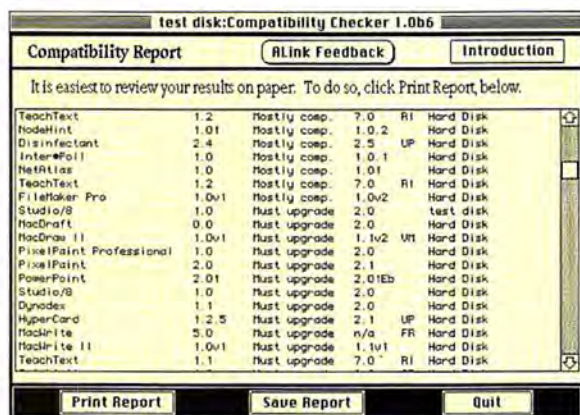


Figure 2: Apple's Compatibility Checker is a HyperCard stack that scans your hard disk and tells you if your software is completely, mostly, or not at all compatible with System 7.0. It can also identify and remove incompatible INITs in the System Folder.

also contains complete System software for versions 6.0.3 to 6.0.7.)

There's also a HyperCard stack called the Compatibility Checker (see Figure 2), which scans a Mac setup and tells you if there is enough RAM and hard-disk space to run System 7.0 and whether you have incompatible programs. (To find out whether your favorite software is System 7.0-friendly, see "System 7.0: Getting Down to Business," elsewhere in this issue.) Another HyperCard stack contains a list of network software that's compatible with System 7.0. The stacks work with HyperCard 1.2.2 or later, and HyperCard

2.0 comes with the Group Upgrade Kit.

The CD-ROM also contains electronic copies of the documentation included with the Group Upgrade Kit. Although macho Mac users don't use manuals, System 7.0 is a new species. When people forget how to turn off Balloon Help, you can avoid a crowd at your desk by posting the documentation on a file server or printing out copies. The documentation includes the *What's New* and *Installing System Software* guides, a new *Macintosh Reference*, and the *Macintosh Networking Reference*. (Apple dealers will be selling additional "five-packs" of these manuals for \$249.)

Network Considerations

Before using the Group Upgrade Kit, you should plan how System 7.0 will affect each part of your network. First consider the users' workstations, and decide which Macs to upgrade. Not everyone will need or want System 7.0 at first, and users who are on a strict deadline or who don't have the time to learn System 7.0 can be upgraded later.

System 6.x and 7.0 users can coexist on the same network if you perform the upgrade properly. One potential problem with a mixed network is incompatible LaserWriter drivers. Version 7.0 of the driver is not compatible with version 6.x (or earlier versions), which means users of these two versions will continually be resetting the printers. Fortunately, Apple's Group Upgrade Kit comes with a special Printer disk that lets you install version 7.0 of the LaserWriter driver on Macs running System 6.x. Users who have driver 6.1 don't need an upgrade, because version 6.1 is compatible with version 7.0. Both the 6.1 and 7.0 versions of the LaserWriter driver enable Macs to use TrueType fonts (provided they are running System 6.0.7 and have the TrueType INIT).

To upgrade AppleShare print servers, all you have to do is add the new Laser-Prep file from Apple's Group Upgrade Kit. Important note: You should *not* upgrade the System running under the AppleShare print or file server to System 7.0; the current release (version 2.0) of the AppleShare print and file servers is incompatible with System 7.0.

Fortunately, you don't have to wait for a System 7.0-compatible AppleShare to upgrade your network, because System 7.0 users can access AppleShare servers running System 6.x. In addition, System 7.0's built-in distributed-server scheme, called file sharing, is completely compliant with AFP (AppleTalk Filing Protocol). Both System 6.x and 7.0 users can access folders or disks that System 7.0 users have chosen to share; the shared volumes look like normal AppleShare volumes and are accessible through the Chooser. These folders are also accessible by DOS users who have Farallon's PhoneNet Talk PC (formerly called AppleShare PC).

System 7.0 users with CE Software's QuickMail will need to upgrade to version 2.5. Like AppleShare 2.0, however, the QuickMail server software must run on top of System 6.0.5 or 6.0.7. Microsoft Mail users must upgrade to version 3.0 to be compatible with System 7.0; Mail

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BRIDGES OPERATING SYSTEMS

7 Steps for Installing System 7.0 on Your Network

1. Buy Apple's System 7.0 Group Upgrade Kit. Make electronic copies of the documentation available on the network.
2. Decide which Macs will get System 7.0.
3. Become System 7.0-savvy: Install and use System 7.0 on your Mac first. Run the Compatibility Checker to see if you have incompatible INITs or applications on your Mac.
4. Check users' Mac setups with a network data gatherer (Status•Mac, Network SuperVisor, or GraceLAN). Correlate the data with Apple's list of incompatible software. Install needed hardware (RAM, PMMU chips), and remove incompatible software.
5. Install LaserWriter driver 7.0 on Macs still using System 6.x. Upgrade all network routers and EtherTalk Macs to AppleTalk Phase 2.
6. Mount the System 7.0 installation folders on the network. Tell users to access them and to click on the Install button before leaving the office for the day.
7. Make the Compatibility Checker available to users via a file server. Encourage people to use it after installing additional INITs and applications on their Macs.

Not Enough RAM						
	User Name (Users)	Zone/Server Name (Users)	Machine Type (CPU)	RAM Size (CPU)		
May Need MF Training						
#	User Name (Users)	Zone/Server Name (Users)	Machine Type (CPU)	RAM Size (CPU)	Multifinder? (CPU)	
1	Gabriel Fortshte	Editorial	II	8192	Off	

Large Application Mem.						
#	User Name (Users)	Zone/Server Name (Users)	Application Name (App)	Suggested Memory (App)	Allocated Memory (App)	Volume (App)
1	John Pizzo	Editorial	MacDraw™ 2.0	1500	1500	PhotosNet
2	Peter Winney	Advertising	MacDraw™ 2.0 11	1500	1500	Editor
3	Gabriel Fortshte	Editorial	Photoshop	2048	4000	MacDraw
4	Vicky von Bied	Editorial	Adobe Photoshop™	2048	2500	MacDraw
5	John Pizzo	Editorial	Uthmaniyah™ 1.4	2048	2048	PhotosNet
6	Gabriel Fortshte	Advertising	PageMaker 4.0	1500	2600	Editor
7	Peter Winney	Advertising	PageMaker 4.0	1500	1500	Editor

Figure 3: Status•Mac's System 7.0 Readiness Kit comes with report templates that identify users who may need training or extra hardware for System 7.0. The templates sift through the mountain of information that Status•Mac gathers over the network.

servers can remain under System 6.x if you wish, but Microsoft recommends upgrading them to System 7.0 so they can use version 3.0's new features.

Macs running Apple's Internet Router software can use either System 6.x or 7.0, although there is no particular benefit to running Internet Router on System 7.0. If you do upgrade the router Mac, be sure you drag the LocalTalk (Modem) and LocalTalk (Built-in) files that are in the Mac's System Folder into the Extensions folder. The Installer automatically moves all other files to where they should be.

When you install System 7.0 on a network, Apple recommends that you upgrade all routers and workstations to AppleTalk Phase 2, if you haven't already done so. A network that mixes AppleTalk Phase 1 and Phase 2 can have communications problems under System 7.0. For example, if you install System 7.0 on an Ethernet network, workstations that use Phase 2 won't be able to talk to those running Phase 1. If you decide to keep the entire network on AppleTalk Phase 1, you must reinstall Phase 1 EtherTalk drivers on the System 7.0 workstations. Upgrading to System 7.0 doesn't have any

adverse effects on LocalTalk or TokenTalk networks that use AppleTalk Phase 2. (For more on AppleTalk Phase 2, see "Finally Phase 2," November '89, page 248.)

Getting Ready to Upgrade

Before upgrading the Macs on your network, you should first familiarize yourself with System 7.0 by upgrading your own Mac. The last thing you want is cries of "Return to System 6!" because you can't answer questions. To make sure you don't have any INITs or applications that will bring System 7.0 to its knees, be sure to run Apple's Compatibility Checker before you do anything else.

To upgrade the rest of your network, you must first prepare the Macs. System 7.0 requires a hard drive and at least 2 megabytes of RAM, but most users will probably want more than that to run System 7.0 and today's RAM-hogging applications. Owners of the original Mac II who want to use virtual memory will need 68551 PMMU chips (only the SE/30 and II family support virtual memory). You should also check the compatibility of add-in boards; at press time, there were indications that some NuBus boards may

have problems with System 7.0.

There are also software-preparation issues. You need to verify that users don't have an extra System Folder or two squirreled away on their hard disks and that each Mac's complement of software doesn't contain incompatible applications, INITs, and cdevs. If your office is small enough, you can run around to each Mac and use the Compatibility Checker (it doesn't run over the network), but the Compatibility Checker gives you information only on third-party software — it doesn't tell you anything about System software and hardware. The best method is to use a network-data gatherer such as Status•Mac from Pharos Technologies, Network SuperVisor from CSG Technologies, or GraceLAN from Technology Works. In a matter of hours, these programs can deliver information on the network's hardware and software that might otherwise take you weeks to collect.

Status•Mac and Network SuperVisor create a database of the information you collect; GraceLAN gives you a one-time report on-screen or on paper. All three tell you what INITs and applications each workstation is running as well as the version number of its printer driver and System file. (Don't be surprised if several users are already on System 7.0!) The reports also tell you how much RAM each Mac has and whether it has the 68030 CPU or 68551 PMMU chip needed to run virtual memory.

Pharos is now shipping the System 7.0 Readiness Kit with version 2.0 of Status•Mac. (Owners of version 1.0 can get the kit free from Pharos.) The kit contains a set of Status•Mac templates (see Figure 3) that ask questions pertinent to System 7.0. The templates also identify those users who may need training — by letting you know, for instance, who is not using MultiFinder or the System RAM cache, neither of which can be turned off in System 7.0. The templates also tell you who has set large RAM allocations for applications; these users are probably working with large files and can make good use of additional RAM. Finally, the Status•Mac templates let you know whether each user has enough vacant hard-disk space to run virtual memory.

Although you have to fix hardware incompatibilities by hand, you can use VersionTerritory from SoftWriter ([512] 244-3999) to upgrade users' software over the network. You teach VersionTerritory how to upgrade one machine, and then the

program can upgrade the same applications on other Macintoshes on the network automatically. VersionTerritory works in the background, without interrupting the users' work.

The Installation Process

Once you've finished all your compatibility checks and other preparations, you're ready to install System 7.0 on the workstations. The simplest method is to mount the installation folders on the network and let users access them individually, preferably by clicking on the Install button before they go home in the evening. The System 7.0 Installer can do multiple upgrades simultaneously, and night is a good time to perform the upgrades, because network traffic from the multiple installations is likely to be heavy.

There are three ways to mount the installation folders. The easiest method is to mount the System 7.0 Upgrade CD-ROM on a Mac running System 7.0 and then use file sharing to make the installation folders available on the network. The drawback is that file sharing has a limit of ten users per folder.

For bigger upgrades, you can mount the CD-ROM as a volume on a dedicated AppleShare File Server, which is faster than System 7.0's file sharing. However, you won't be able to restrict users' access to other parts of the CD-ROM, because it is a read-only volume. You can get around this by copying just the installation folders to an AppleShare hard disk. You'll probably want to disable the Make Changes privileges to prevent people from fiddling with the files.

You should also make the Compatibility Checker available on a file server. Users should be encouraged to use it after installing new INITs or applications on their Macs, because fresh incompatibilities will probably crop up as time goes on. Before you trash a suspect INIT, however, try moving it around in the System Folder. Some INITs may not work in the Extensions folder (their new home in System 7.0) and may have to sit at the top level of the System Folder. These sorts of problems shouldn't be of too much concern, but you'd better get used to troubleshooting for a while — there are likely to be lots of things floating around that System 7.0 doesn't get along with. ☐

Technical editor John Rizzo has been beta-testing System 7.0 for a year and is relieved to see the real thing.

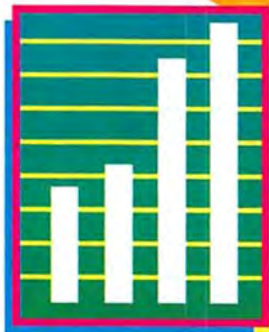
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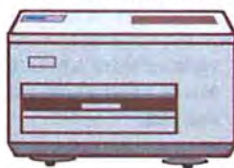
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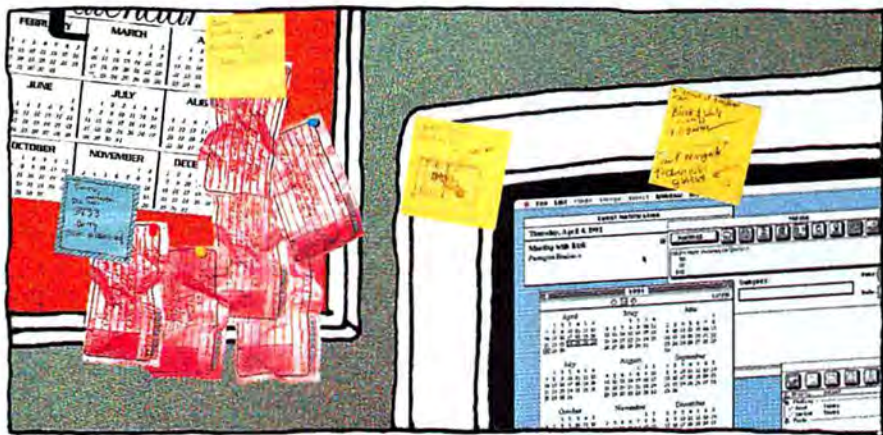
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Holistic Troubleshooting

If your network isn't improving office productivity, the problem may lie not in the technology but in the way you're applying it.

By Kurt VanderSluis



The goal of a computer network is to improve productivity by streamlining communications, automating time-consuming and inefficient tasks, facilitating information access, and sharing expensive resources such as laser printers. As a network manager, you can do more to improve productivity than just installing the latest hardware and optimizing wiring schemes: You can teach people how to use the technology to complete their work faster and more easily. Sometimes this means trading a traditional method of exchanging information for a new one, such as replacing paper memos with electronic mail. In other cases, completely replacing a noncomputerized system can actually hurt productivity; instead, you should focus on enhancing it. The trick is to figure out which tasks are best suited to computerization and how to apply network technology for optimum productivity.

Some forms of interaction have to be done face-to-face and shouldn't be replaced by an electronic method. In such situations, you should consider how to *enrich* — rather than *replace* — the existing procedures. One example is an employee's performance review by a supervisor. Although conducting the review by E-mail might make the process more efficient and less time-consuming, it's the wrong sort of task to computerize, because the success of the review depends on face-to-face contact.

Improving productivity doesn't mean depersonalizing the office; instead, we want to make people's interactions more meaningful and effective. In terms of the performance review, using E-mail to schedule the appointment and exchange review materials that must

be prepared ahead of time means that both the supervisor and the employee can arrive at the interview with all the "paper"-work completed, thus focusing the meeting on their personal communication.

Other procedures can be enhanced by computer technology if current methods are only partially successful in accomplishing their goals. Suppose one of your company's business goals is to have greater project visibility among departments. Increasing the information flow among departments would help avoid duplication of effort and create more synergy between the company's projects. Unfortunately, communication between departments is almost nil. If your workplace is like most companies, the common methods of exchanging information interdepartmentally are casual encounters in the hallway, at the vending machines, or on the company sports team. Although some information is being exchanged, it happens only by chance and is therefore unreliable. Computerizing this random and incomplete information exchange won't make it successful, however, unless it is first redesigned.

Sometimes you can prototype an electronic setup by first creating a noncomputerized system that accomplishes similar goals. In our example, you might create a special bulletin board that displays people's pictures and their project descriptions, institute a series of lunch-time seminars, or start publishing a newsletter. During this prototyping phase, you can observe and fine-tune the process until you've learned exactly what works and what doesn't. You'll also find it easier to get people started using a brand-new system if it has a physical component. Having a bulletin board or a newsletter gives people a visual reminder to make their



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contributions to the interdepartmental exchange.

Once the new system is in place, casual conversations will still take place in the hallways, but they may be more informed. Instead of "Hey, nice tie — what are you working on these days?" you may hear "Hey, nice tie — that study of the ethnography of Pacific logging companies in the 1880s sure sounds interesting. How are you guys coming along?"

Now that you have a working setup that accomplishes your information goals, you can evaluate whether it can and should be computerized. The potential benefits of computerizing your information-exchange process might include the ability to add more people, departments, and company sites; the ability to update information more often and with less effort; and place-and time-independence of the information. There are also arguments against computerization: No one person is responsible for managing and updating the information, so the system might disintegrate or lose focus. Some people won't use the computer, whereas everyone will certainly pass by the bulletin board.

It's hard to predict exactly what will happen, so be flexible. Perhaps some people won't like E-mail and will resist the new system. On the other hand, the very fact that the communication is time- and place-independent may make some people who were formerly excluded from group dynamics feel included for the first time. During the precomputer phase, pay particular attention to elements of the system that make it successful. Do people like the pictures, the ability to casually browse through the information, or some particular gossip content? Be sure to integrate these success-making elements into the computerized solution.

Some office chores may work the way you're doing them now but involve a lot of effort or drudgery to complete. Replacing the current procedure with an electronic method may significantly boost productivity. To find out which tasks would benefit from computerization, look around your office and talk to your users. The resulting list might include such things as filling out and turning in expense and status reports, scheduling meetings, generating and approving documents, coordinating resources, and leaving messages for people who are away from the office. Meet with a few of the users, and pick a task or two that you can automate with your existing technology. To computerize

the task, you may have to develop some macros, make spreadsheet or word-processing templates, create a new E-mail form, or develop a simple database or HyperCard stack.

For example, you might use a spreadsheet template and E-mail to automate expense-report filing. This is usually a good candidate task because it involves drudgery, it does not depend on human contact, and you probably have a working method already. To computerize this chore, you must create a spreadsheet template for the report and make it accessible to all users by placing a locked version on your file server. If using a spreadsheet is beyond your users' capabilities, you can create a HyperCard stack that builds the report for them. Once the stack or spreadsheet has been created, you can make it easily retrievable by linking it to your E-mail system with Microsoft Mail's HyperCard or Excel hooks or through CE Software's QuickMail menus.

When you've finished the development phase, try your new solutions out for a week or so to make sure that you've worked out all the bugs. Be sure to include users with a complete range of computer abilities and aptitudes in your beta-testing process. This solution must be for everyone, not just the experts. Use this beta-testing period to find out where the new method is more difficult, confusing, or laborious than the old process. Don't hover over the testers' shoulders while they try it — you want to find out how usable the setup is when you're not there.

Once you're ready to unveil the enhanced or overhauled office procedure, do it with flair. It's important to get a critical mass of employees using the new method right away, or it may fail for lack of participation. Put out memos and hold an open house to make sure that everyone finds out about the innovation. Create computer-based instructional materials to ease the transition. Use your beta testers to help people who have trouble with the new system.

Computerizing an office is tricky. If you're flexible with your solutions and listen carefully to the users, however, your methods will be appreciated and successful. Applying the right solutions to the right problems will make your office more productive and help people spend their time doing more-meaningful work. ■

Kurt VanderSluis is president of The Network Group, a training and consulting firm in Seattle.

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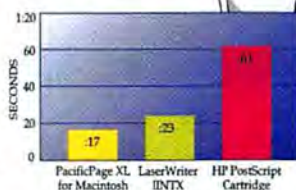


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Converting to System 7.0

This step-by-step guide to switching to the new System will have you up and running in no time.

By Craig Danuloff

Installing a System-software upgrade has its own thrills — where else can you find the allure of the new and exciting mixed with the danger of incompatibility? During its prolonged beta-testing, System 7.0 proved itself to be fairly compatible with existing applications and utilities and safe to both hard drives and data — but this doesn't mean that you should upgrade to System 7.0 without planning or taking some precautions.

There are two ways to get System 7.0: The Personal Upgrade Kit and the Group Upgrade Kit. For those who are using the Personal Upgrade Kit, the following ten steps show how to install the new System software and to quickly begin taking advantage of the new features of System 7.0. Before you do anything, however, remember to back up your entire hard drive and keep a copy of your old System in a safe place.

(See "System 7.0: Getting Down to Business," elsewhere in this issue, for the ways to get ahold of System 7.0, and "System 7.0 on a Network," in this issue's Bridges section, for how to install it across a network.)

1. Take a tour of System 7.0's new features. The Personal Upgrade Kit contains two extra floppy disks: Before You Install and Networking Basics Tour. If you're unfamiliar with what the new System has to offer or if you're new to the Mac, spend some time with these disks. Before You Install includes a HyperCard tour of System 7.0's new features (see Figure 1) plus a minitutorial on multitasking with the new Applications menu. The Networking Basics Tour is another HyperCard stack that introduces you to the Mac's expanded networking capabilities and explains file sharing, the role of the Chooser,

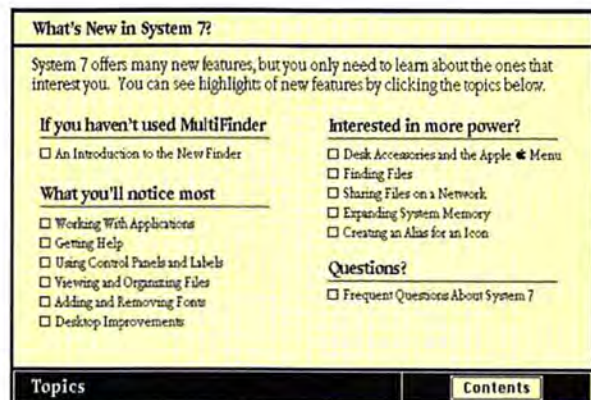


Figure 1: You can tour System 7.0 while still running System 6.x by exploring the Before You Install disk that comes with your new System software. A HyperCard stack on the disk outlines the System's new features and includes a minitutorial on multitasking.

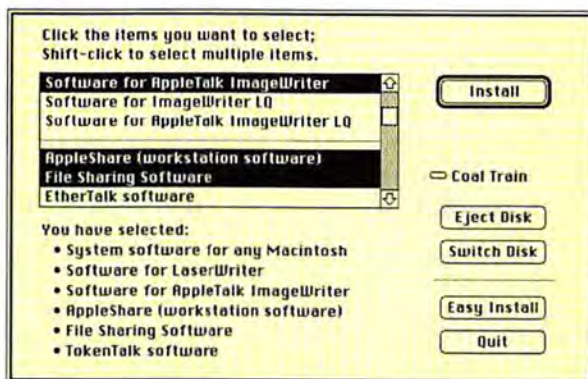


Figure 2: Installing System 7.0 is simply a matter of launching the installer on the first disk of the new System software. The Easy Install option installs the System software and all printer drivers and network options. The Customize option, shown here, lets you select your own installation options.

and aliases across a network. (For a detailed description of what System 7.0 has to offer, see "70 Things You Need to Know About System 7.0," June '91, page 96.)

2. Run the Compatibility Checker.

System 7.0 is a sophisticated leap forward in System software, so you may have some compatibility problems with programs you used without problems under System 6.x. To minimize the impact of incompatible programs, Apple has included a HyperCard stack on the Before You Install disk that searches for incompatibilities on all the hard disks connected to your system. The Compatibility Checker contains information on about 150 of the most frequently used Mac programs (the exact number of programs to be included

was not set at press time). When you run the checker, you get the following information: whether you have enough memory and disk space to run System 7.0, which incompatible programs should be removed before you install System 7.0, and which applications that work under System 7.0 are in available newer versions.

After you've backed up your entire system, go ahead and weed out those applications and utilities that might cause problems under System 7.0. INITs and cdevs can also cause problems. If you're installing System 7.0 onto a hard disk that's running System 6.x, you should create a new folder for all the INITs and cdevs in the System Folder that you are not absolutely sure will work under 7.0—including network and printer drivers

from vendors other than Apple.

3. Run the System 7.0 Installer. Your new System software comes on eight floppy disks; installing System 7.0 is simply a matter of using the Installer on the first of them. Unlike previous System software versions, System 7.0 can be installed onto your hard drive even while that drive is the startup disk.

After launching the Installer, you can either use the default Easy Install, which installs the System software, printer drivers, and network options listed in the Easy Install dialog box, or you can use the Customize button, also in the Easy Install dialog box, to select your own installation options (see Figure 2). As the installation proceeds, you'll be prompted for the additional floppy disks.

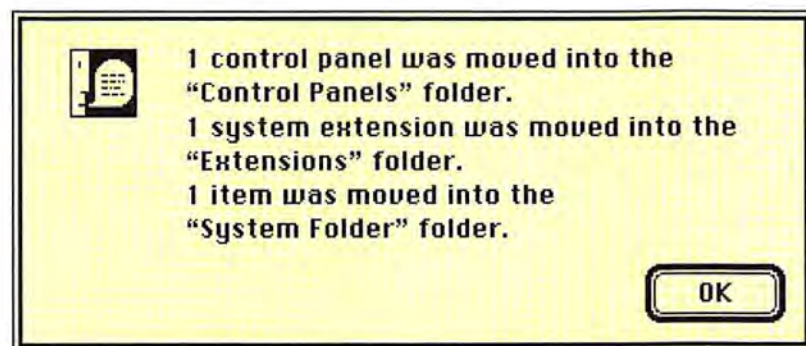


Figure 3: System 7.0's "invisible hand" helps keep your System Folder organized. If you drag extensions, control panels, or other files into the System Folder, System 7.0 automatically places the files in the correct folder.

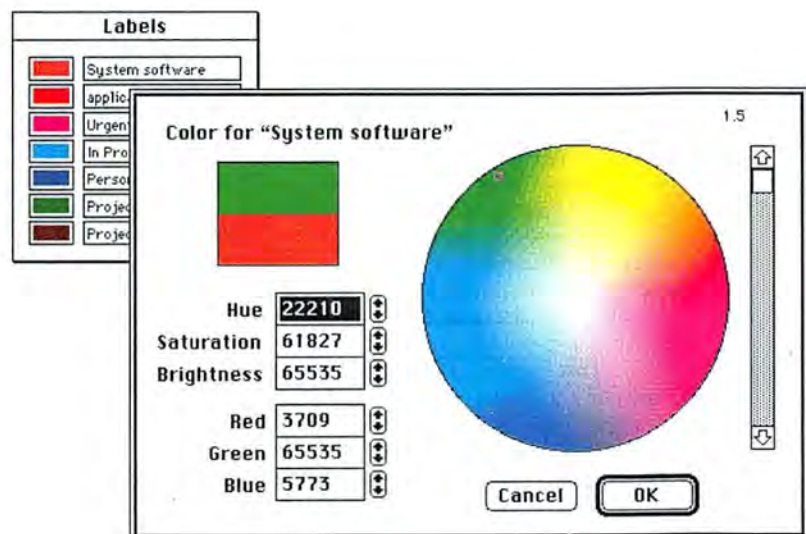


Figure 4: System 7.0's Labels control panel lets you color-code your applications and files for easier identification. You can name up to seven category labels and configure their colors.

If you're installing System 7.0 on top of an existing copy of System 6.x, bit-mapped fonts in the old System file will be moved into the new System file, and DAs will be converted into stand-alone applications and be placed in the Apple Menu Items folder.

4. Restart your Mac. Welcome to System 7.0! As the new System mounts each of your hard drives or partitions, you'll see the message "Updating for New System Software." Don't be alarmed — no data on your drives will be changed and you can still use your data with older versions of the System software if you need to.

Once you're sure your System is working, you can begin reinstalling your favorite INITs (renamed extensions) and cdevs (renamed control panels). If you've created an INITs folder or if your 6.x System Folder is on a separate hard-disk volume, drag the icon of one extension or control panel at a time onto the icon — not into the window — of the System 7.0 System Folder.

It's important to reboot after each new addition to make sure that each one works with other extensions and applications. If you install several at once and then have problems, you won't know which is the troublemaker.

System 7.0 is "intelligent" about where to put extensions and control panels: It puts them into what it believes to be the proper folders (see Figure 3). Unfortunately, many extensions and control panels originally developed for use under System 6.x don't behave properly when placed in their new homes. You may have to move things around a bit to get them to work. Try putting troublesome extensions into the System Folder itself instead of in the Extensions folder (you'll have to open the System Folder window to do this instead of dragging the extension's icon into the folder).

Also pay attention to where you (or System 7.0) put auxiliary files (such as preferences or data files) that some extensions and control panels need to access to run properly. Again, try moving things around if you have trouble. If all else fails, call the product's tech-support service (if your problem is with commercial software) or hit the bulletin boards (if you're dealing with shareware or freeware).

You can now install additional extensions, control panels, and printer or network drivers by dragging them into the System Folder.

You can add up to 52 items to the Apple Menu Items folder; each of these items then appears on your Apple menu.

5. Install additional fonts. System 7.0 automatically installs the default bit-mapped Mac fonts (New York, Monaco, Geneva, and Chicago) along with TrueType versions of Times, Helvetica, Courier, and Symbol into your System 7.0 System file. Any other bit-mapped fonts that were in your System file are also copied into the new System file.

To install bit-mapped fonts that aren't in the System file, drag their suitcases onto the System Folder or System-file icon or open the font suitcase (double-click on it) and drag the fonts one by one onto the System Folder or System-file icon. Installing Type 1 outline fonts isn't quite this straightforward. At press time, Adobe was still working out how ATM will operate under System 7.0. For now, if you use Suitcase II with ATM, you can continue doing so — but you'll have to use version 1.2.9 of Suitcase II.

6. Convert your DAs. DAs stored in DA suitcases cannot be used in System 7.0 until they're converted to stand-alone, double-clickable applications. The easiest way to convert them is to install them in the Apple Menu Items folder by dragging the DA suitcase into the System Folder. If you want to place DAs outside the Apple menu, double-click on the old suitcase icon. This opens a window in which the DA appears as an application icon. All you have to do is drag the DA out of this window into any folder or volume, close the suitcase window, and delete the empty suitcase.

7. Define labels. The Finder's Label menu allows you to classify your files using seven categories. To configure the names for each label, open the Labels control panel in the Control Panels folder, usually found on the Apple menu (because control panels are double-clickable under System 7.0, they're no longer necessarily on the Apple menu). This control panel lets you change not only the label names but the color as well (see Figure 4).


You can assign label categories any way you want. For example, you can use one label for System-software files, one label for applications and utilities, and the

remaining five for large projects or data classifications that describe your files.

8. Create aliases. There are two types of aliases you'll want to create immediately. First, create aliases for your favorite applications, utilities, folders, and files. Install these aliases on the Apple menu by placing them in the Apple Menu Items folder inside the System Folder. These programs will now be accessible from the Apple menu. Second, create aliases for files you would like to access easily but now keep on removable media, floppy disks, or network servers to save space on your local hard disk. Alias icons take up only 3K of space each, and you can store them anywhere on your hard disk. When you double-click on an alias icon or select the filename in an Open dialog box, you'll be prompted to insert the disk containing the original file or the network volume containing the file will be mounted.

9. Customize the Apple menu. You can add up to 52 items to the Apple Menu Items folder, inside the System Folder, and each of these items then appears on your Apple menu. You can add five types of files: applications (including what were DAs in earlier System versions), control panels, folders, documents, and networked volumes. To keep your hard disk organized, don't put original files into the Apple Menu Items folder — use aliases instead.

10. Configure virtual memory and 32-bit addressing (optional). Using the Memory control panel, turn on the Virtual Memory option if you would like to use a portion of your hard disk to increase the amount of available memory. This option requires a 68030 or PMMU chip, which limits it to the SE/30 and Mac II family.

If you're using a Mac LC, IIsi, IIfx, or IIfx, you can turn on the 32-Bit Addressing option, which allows you to use more than 8 megabytes of installed RAM in your Mac. By combining virtual memory and 32-bit addressing, you can access up to 1 gigabyte of memory (provided you have the disk space) — but only on the IIsi, IIfx, or IIfx (the LC doesn't support virtual memory). Some existing applications are not compatible with 32-bit addressing, so take care when first working with this option. After changing the options in the Memory control panel, you must restart your Mac for the new option settings to take effect. 

Craig Danuloff is the author of *The System 7.0 Book* (Chapel Hill: Ventana Press, 1991) and the *Encyclopedia Macintosh* (San Francisco: Sybex, 1990).

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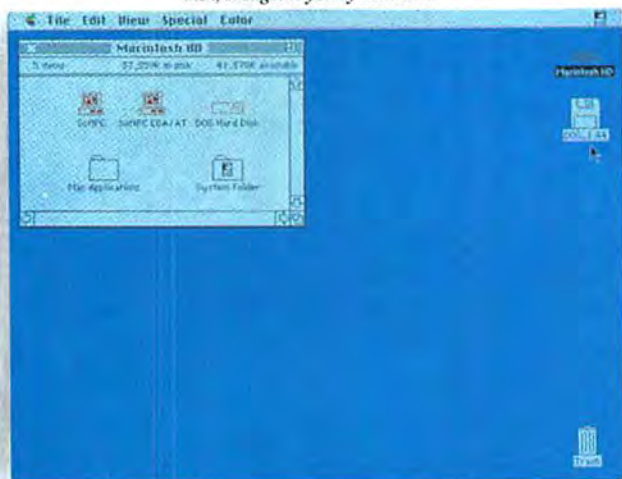


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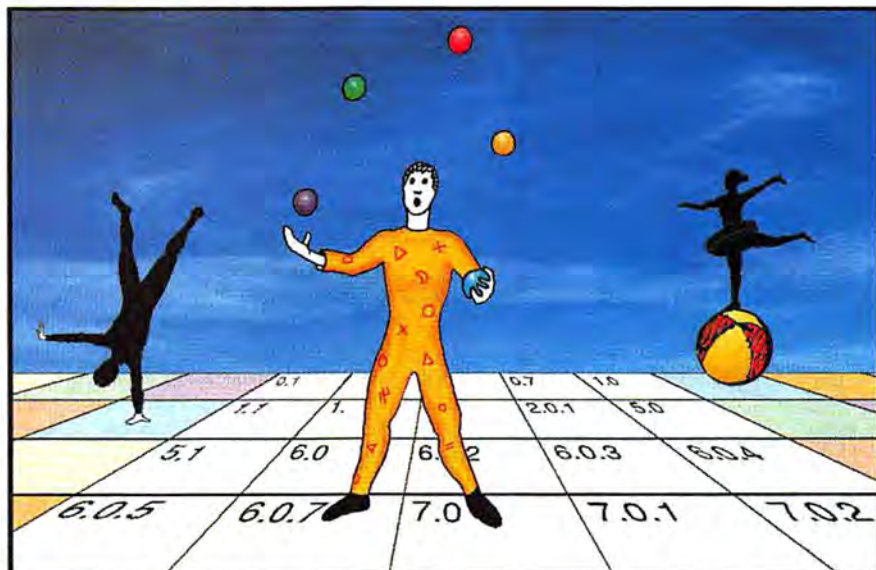
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Seven Can Wait

When should you upgrade to System 7.0? What's it going to cost you? Here's the scoop about what to expect and when to expect it.

By Bob LeVitus



By now you're probably sick of hearing about System 7.0. The last couple of issues of *MacUser* have focused on it, and it's been mentioned, dissected, discussed, analyzed, and speculated about in almost every issue for the past 18 months. But with a couple of exceptions, almost everything I've read implies that you should switch to System 7.0 the moment it ships.

Not so fast. This may be an unpopular viewpoint, but for many of you, sticking with System 6.x a while longer is smart. Unless you don't have to worry about deadlines and your work environment is extremely straightforward — that is, you don't use a lot of applications, INITs, cdevs, and DAs — your upgrade will be smoother and you'll encounter fewer bugs if you wait a few months. When you do upgrade, be prepared to dip into your wallet frequently — not just for the System 7.0 upgrade itself but also for extra RAM (if you have only 1 megabyte) or a bigger disk drive as well as upgrades to any incompatible software you may use and upgrades to new System 7.0-friendly versions of your favorite programs.

Apple 7, Users 0

Let's face it: System-software version numbers that end with a zero can have their problems. For example, the bugs weren't shaken out of System 3.0 until version 3.2. More recently, System 6 took a couple of upgrades to stabilize, and for some people, version 6.0.4 was the first reliable version.

Don't get me wrong — rewriting the Macintosh operating system from the ground up is a big job, and System 7.0 is the most comprehensive, demanding software-engineering project Apple has yet undertaken. What's more, System 7.0 is undergoing the most extensive testing ever — several months before its official release, beta copies were in the hands of more than 13,000 software and hardware developers, Apple employees, and computer journalists. When the fourth beta version was released last February, it was so stable that I started using it every day. Even so, System 7.0 *will* have bugs — bet on it. In fact, I'll eat my cowboy hat if we don't see System 7.0.1 (and maybe even 7.0.2) within six months of the initial release.

The point is, if you upgrade to System 7.0 the day it's released, you'll probably have to upgrade again in a few months. Several months later, you may have to do it yet another time. So why not save yourself a couple of painful and time-consuming upgrades by waiting a couple of versions before making the switch? Let other people field-test System 7.0 while you're being productive with System 6.x.

It'll Cost You . . .

Because the upgrade is big (ten floppies or a CD-ROM), it's going to cost something to get your copy, whether you get it from a user group; from an on-line service such as CompuServe, GENie, or AmericaOnline; or as a shrink-wrapped upgrade from an authorized

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Apple dealer (see "System 7.0: Getting Down to Business" elsewhere in this issue for prices). The cost for copies from user groups will vary, but I can't imagine it being much less than \$30 or \$40 per ten-disk set. The cost of downloading it from an on-line service will be at least that expensive. And, of course, copies downloaded or purchased from user groups don't include printed documentation.

But the cost of System-software upgrades is only the beginning. The hidden costs come when you have to upgrade applications, INITs, and cdevs. Although I'm still using a beta version of System 7.0 as I write this, if my experience is any indication, you're going to find that some of the programs you depend on aren't 100-percent compatible with System 7.0 and will require an upgrade (see Table 1 in "System 7.0: Getting Down to Business" to find out how several popular programs fare).

There are different degrees of compatibility. Totally incompatible programs — of which there are very few — crash immediately if you try to use them with System 7.0. Several programs are partially incompatible — they work most of the time but crash occasionally or malfunction in some nonfatal manner. You may be able to limp along with one of these programs, but you'll want to upgrade eventually. And many of the programs you use under System 6.x work under System 7.0 with virtually no problems at all. The best programs of all, however, are those that are "System 7.0 friendly" — these programs not only run perfectly but also take advantage of System 7.0-specific features such as balloon help and publish-and-subscribe. A few System 7.0-friendly programs should be available by the time you read this, but System 7.0-friendly versions of some of your favorite programs may take a little while to appear.

Because I am writing this before System 7.0 ships, I tried to find out what other users think will happen when System 7.0 is released. I posted the following question on Zmac: "What percent of the software that you use do you expect will require an upgrade to be totally compatible with System 7?" The responses ranged from 10 percent to 75 percent, with all respondents expecting at least one or two of the programs they use successfully with System 6.x to break under System 7.0. So you may be looking forward to upgrading at least 10 percent of your software after install-

Face it — no matter when you install System 7.0, some of your software will need upgrading. And that's gonna cost you. Most of the publishers I talked to hemmed and hawed over committing to free upgrades.

ing System 7.0. And if you want the snazzy new System 7.0-friendly versions that should start appearing about now, prepare yourself for even more (and more expensive) upgrades.

So face it — no matter when you install System 7.0, some of your software will need upgrading. And that's gonna cost you. Most of the publishers I talked to hemmed and hawed and explained how they hoped to be able to provide their System 7.0 upgrade at no charge, but only one — Microseeds Publishing (Redux, Rival, INITPicker) — would commit to free upgrades.

If It Ain't Broke . . .

System 6.0.5 and 6.0.7 are remarkably stable, as are the broad spectrum of applications, INITs, and cdevs we use with them. Because this is the case, you may as well wait a while until both System 7.0 and all those new System 7.0-friendly programs get their kinks worked out. You may spend more time working and less time troubleshooting if you stick with dependable old System 6.x for just a little while longer.

Besides, for those who are in a hurry to use some of those cool new System 7.0 features — such as aliases and file sharing — some of them are available now from third parties for use with System 6.x (see "Living Without System 7.0," June '91, page 218). You may find the System 6.x counterparts just as good as their System 7.0 equivalents. In fact, as Mac guru David Sternlight puts it, "Given the time, effort, and hype put into it, I fear that for users with sophisticated System 6 configurations, System 7.0 will prove a big disappointment. On the other hand, for those who haven't spent heavily on System 6 extensions, they will get many features they now have to pay for 'free' (although

they're not as powerful in some cases) with System 7.0."

For example, if you like System 7.0's aliases (which let you clone icons and place the clones anywhere on your hard disk), you'll appreciate HandOff II (from Connectix), Tiles (from CE Software), and File Director (from Fifth Generation Systems), which are powerful tools for organizing your work in System 6.x without moving files or folders around. Although aliases are one of the nicer features of System 7.0, all three of these products provide (in my humble opinion) more elegant functionality under System 6.x than aliases do under System 7.0.

That's not to say that System 7.0 doesn't have powerful and unique features. IAC (interapplication communication), the feature that allows programs to send information to each other, will revolutionize the way we and our computers work together. A simple example of IAC is publish-and-subscribe, which provides live links between documents. Say you create a bar graph in Excel and want to use it in a program, such as MacWrite II, that doesn't have a built-in graphing function. Rather than copying the graph and pasting it into the word-processing document, you can publish it, which makes it available to other programs. When you open MacWrite and subscribe to the bar graph, it appears in your MacWrite document. If you return to Excel and change the bar graph into a pie chart, the bar graph in the MacWrite document automatically becomes a pie chart. The implications are astounding, especially when you consider that you can use publish-and-subscribe over a network, using System 7.0's built-in file-sharing capability.

Unfortunately, programs using publish-and-subscribe will initially appear slowly. The big players will implement it first — look for System 7.0-friendly applications from companies such as Microsoft, Claris, and Farallon when System 7.0 ships. Eventually, most Mac programs will have capabilities far more powerful than publish-and-subscribe built in to them, and you'll wonder how you ever got along without IAC. But I think the process is going to take a couple of years. Programs have to be rewritten to take advantage of IAC, and that won't happen overnight. In fact, I predict that by the end of 1991, less than 20 percent of available software will support publish-and-subscribe.

This is a case in which there is a similar feature under System 6.x but the feature is

nowhere near as powerful as that in System 7.0-friendly programs. Microsoft Word and Excel have "hot links" that are similar to publish-and-subscribe, but the implementation is clumsy compared with that of System 7.0. PageMaker can update linked graphics or text automatically or manually. Although these features are mere shadows of what System 7.0 will eventually be capable of, they do work reliably — and they do work now — with System 6.x.

The Bottom Line


As *MacUser* contributing editor Robert Wiggins said last November, "If stability means more to you than being the first on your block with a new toy, you might just wait a few months to see how it goes for the pioneers" (see "Sixes and Sevens," November '90, page 41). Or as my friend Bubba says, "This is one case where it pays for power users to be *behind* the power curve."

For when you do decide to upgrade, here's my advice for making the transition smoothly:

If you have two hard drives or a removable drive, keep your stable, everyday System 6.x configuration on one and install System 7.0 on the other (or install System 7.0 on a removable cartridge). Use the Startup Device cdev (it's called Startup Disk in System 7.0) to control which disk is the startup device. If you don't have two hard disks, keep a floppy System 6.x startup disk handy so you can start up under System 6.x if you need to.

This advice is particularly germane to people who are in tight deadline situations, are involved in production work, or can't afford any downtime. If something that used to work under System 6.x doesn't under System 7.0, you can just restart in your old, comfortable System 6.x environment and get the job done.

Last but not least, perform a complete backup before you install System 7.0 for the first time. Or at the very least, back up your System Folder.

I can't wait for the day when every one of my programs runs as well under System 7.0 as it does today under System 6.x. And the day when every program I use is System 7.0-friendly will really be a day to celebrate. Unfortunately, those days are still sometime in the future. 

Bob LeVitus — author of *Dr. Macintosh* and *Stupid Mac Tricks* — takes over this month as *Beating the System's regular columnist*.



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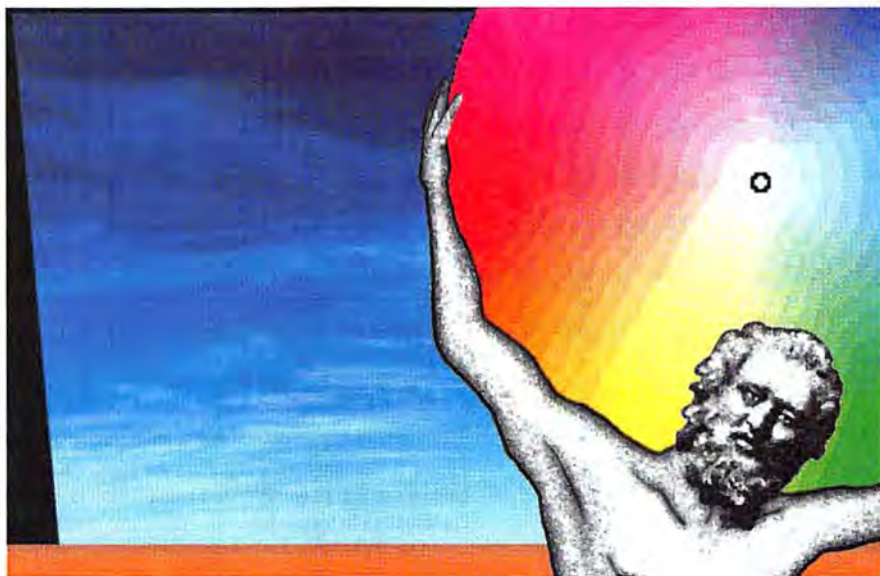
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Living with Living Color

As pretty as 24-bit color is, it can soon overwhelm your system. Here's how to keep it under control.

By Thom Hogan



I can't think of a single Mac user who hasn't been seduced by the beauty and subtlety of 24-bit color. Most people take one look at a two-page color monitor displaying 24-bit color and immediately decide that *this* is the display to lust after, the one to put at the top of their wish list. It's not just a luxury, either — 24-bit color is almost a necessity for anyone dealing with color photos or specifying colors in the Pantone or CMYK systems. Color can also enhance multimedia presentations and makes presentation products such as PowerPoint and Persuasion look their best. And 24-bit color isn't all that expensive — really. You can buy a new display card that works with your Apple color monitor for less than \$1,000.

So if you're stepping into the world of 24-bit color, let me be the first to congratulate as well as warn you: You'll be the envy of your Mac-using friends, but you'll also find a lot of bothersome problems.

Turning It On and Off

Assuming that you've upgraded from 8-bit color (the quasi-standard of the Mac II realm), manipulating 24 bits of color means that your machine is doing a lot more work to put images onto the screen. Because all that work goes through the Mac's central processor, your machine slows down — no matter what you're doing. So, the first rule to learn once you've installed a 24-bit-color board in your system is: Don't use it all the time.

For example, when you have 24-bit color active, whatever program you're using may develop the annoying habit of flashing as you scroll or as the screen redraws. Frankly, I can't stand the flash, so I turn 24-bit color off while working with programs that aren't dependent on color, such as word processors or spreadsheets. As a side benefit, I also get faster scrolling and graphics drawing.

How do you turn 24-bit color off? If you think the only way is to pull down the Apple menu, choose the Control Panel, and go to the Monitors cdev, you're wrong. Fortunately, there's a much easier method. The second rule for using a 24-bit-color-system (indeed, any color system) is: Get a copy of Switch-A-Roo. Similar utilities are available (Screen Flipper, for example), but Switch-A-Roo is my favorite. It's simple, and it's free (you can get it from Zmac and other freeware sources) — what more can you ask for? Switch-A-Roo is an Fkey that lets you configure Command-Shift-9 as a toggle between two video parameters (see Figure 1). For example, now that I have a 24-bit-color board installed, I generally set the toggle between 24-bit and 8-bit color. Switching to the lower color resolution results in faster screen updates (and gets rid of those annoying screen flashes). And to be perfectly honest, I rarely use my system's 24-bit-color capabilities. Only when I'm manipulating color or touching up color transitions in a graphic — with Adobe Photoshop, for example — do I turn on 24-bit color.



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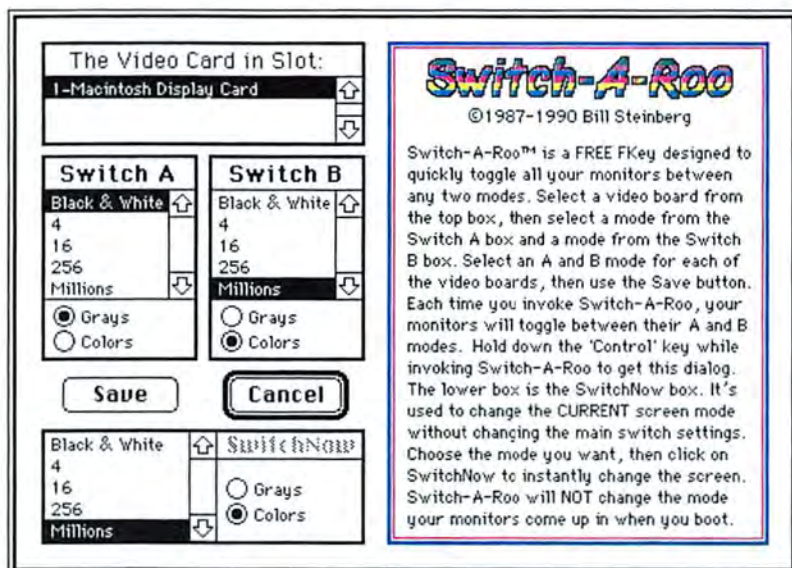


Figure 1: You don't have to access the Monitors cdev every time you want to change the color mode you're working in. Switch-A-Roo is a freeware Fkey that lets you use a key combination to toggle between monochrome and 24-bit color or any other mode you want.

Is Your Disk Big Enough?

If you use 24-bit color a lot (to create or manipulate graphic images, for example), you're going to discover another little rule of the high-resolution world: Your hard disk is never big enough.

Because the size of scanned or painted 24-bit-color images can be stupendous, you need to prepare your system to deal with large files. There are several ways to do this:

- Use a removable-media drive.
- Buy a high-speed, high-capacity hard-disk drive.
- Compress your images on-disk.
- All of the above.

I use removable-cartridge drives for large graphic images. Even though my 42-megabyte cartridges don't hold many high-resolution images each, I prefer not to have images cluttering up my regular hard disk. A simple labeling-and-shelving system makes it easy for me to find the image I'm looking for, and I tend to group related images on cartridges. Because I have a dual-drive Bernoulli box, I can copy these images quickly (it takes just a couple of minutes to copy a 42-megabyte cartridge from one drive to another), and I simply send the copy to the client or service bureau. One warning: This is an expensive way to deal with the problem of large 24-bit images — even with the discount prices now available, removable

cartridges cost about \$75 apiece.

The second solution is to buy the biggest, fastest, meanest hard drive you can find. I strongly suggest that if you select this route, you think seriously about stretching your budget as far as it will go. A 200-megabyte drive probably isn't enough if you're doing a lot of work with 24-bit color. Indeed, I'd look long and hard at those still-very-expensive optical-cartridge drives: They have removable cartridges, and some are fast enough to be tolerable as a regular drive — nice if you're working with hundreds of high-resolution images. In short, money *shouldn't* be the object here: Get the fastest, highest-capacity drive you can afford.

Another potential solution is image compression. Several products — Colorsqueeze from Kodak and Storm Technology's PicturePress, for example — have been developed to work exclusively with color images. These products use the JPEG (Joint Photographic Expert Group) standard to compress images. JPEG compression can result in slight image-quality loss, depending on the level of compression you require, but this is usually not noticeable except at very high levels of compression. These compression products are pretty impressive, letting you reduce a 7-megabyte picture down to an image that's far less than 100K!

The problem with any of these image

compression programs is that they require an extra step when you're loading or saving images, and the software can take a while to perform its magic. If compression intrigues you, keep your eyes open, because several hardware compression products will soon appear. It's quite possible that these will be fast enough to warrant a serious look by anyone using 24-bit color.

Probably the best solution for dealing with huge files is to combine the methods I have outlined above. For example, it makes sense to compress images when you archive them onto a removable cartridge. Compression is still a bit too slow to justify doing it as you're working on an image, however. Instead, compress the image when you're finished working with it or need to send it to a service bureau. Use compression as an archiving technique that saves space on your hard disk or when sending files across a network or via modem. (For more on dealing with huge files, see "Too Big to Fit on a Floppy?" February '91, page 232.)

Can You Make It Faster?

How about QuickDraw accelerators? These accelerator cards improve your Mac's processing speed by routing QuickDraw calls away from the Mac's CPU. If you frequently work with 24-bit color, you might want to consider them carefully, because a good accelerator can come close to eradicating the speed lag 24-bit color adds to your system's screen drawing. The time to consider accelerators, however, is *before* you buy your 24-bit board. Apple, RasterOps, Radius, and SuperMac have acceleration products. Each company has taken a slightly different tack, and you're probably best off if you purchase a video board and an accelerator from the same company.

Despite the claims various companies make, most of these accelerators do about the same thing: They make working with 24-bit color faster than working with 8-bit color. Because of the way the company's designs differ, you'll find that certain accelerators do better with certain software products. Your best bet is to take the software you use most to a store that will let you try out the accelerators you're considering. If you use a wide range of software products in 24-bit color, you'll probably find that the accelerators all have about the same effect. The accelerators provide only a modest improvement in 8-bit-color mode, so you'll probably be tempted to leave the unit in 24-bit-color

Once you've acquired a 24-bit color board, 8-bit color will start to look about as sophisticated as a coloring book with a limited palette of crayons.

mode all the time. Apple's 24-bit accelerated color board, the Macintosh Display Card 8x24 GC, is the exception: At least in the limited time I used it, it seemed to be significantly faster in 8-bit-color mode than the Radius and RasterOps accelerators I've used more extensively.

Accelerators have their disadvantages. If you don't have a II, IIfx, or IIfx chassis, a 24-bit-color card and an accelerator will certainly put you near the limits of your computer's power supply. Things are improving on this front as new technology comes to play, but if all the slots in your Mac are filled or you have a hard drive that draws substantial power, you may have problems. Moreover, the large power draw of these boards results in extra heat — so make sure your machine is well ventilated and the fan is not clogged with dust.

Expect to find some of your software acting idiosyncratically if you install an accelerator. Early versions of Adobe Illustrator were notorious for not working with new color hardware released by third parties. Fortunately, Adobe has fixed those problems in later releases, but you'll still occasionally find a software product that objects to what 24-bit-color is doing in the background. That's another reason to have Switch-A-Roo handy. Many of the programs that react violently to 24-bit color run fine when you switch to 8-bit mode.

What You See Ain't What You Get

And then there's the issue of color matching. The problems inherent in color calibration are almost overwhelming: Color varies across a monitor, lighting can affect your perception of color, you can make only an approximate match between colors on-screen and colors from a color printer, the color-separation and printing process you use directly affects the color rendition, and on and on. Even those people I've talked to who use calibration systems such as TekColor from Tektronix or Radius' PrecisionColor Calibrator say that although these systems help, they don't

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eliminate the problem of matching screen colors to printed ones.

If you're selecting colors on the monitor for a document that will be printed later, you'll have to get used to tweaking the colors after proofing them or else settle for slight discrepancies. That's not to say that some of the color-matching equipment now available won't help make this process easier—I'm simply warning you that it's no panacea. Using a color-matching system won't guarantee that the colors you see on the display are going to look the same on glossy paper from a web press.

I think the expense of color-calibration systems is too high for their overall effectiveness, so my advice is to be careful in shopping for such a system: Make sure it does what you expect *before* you buy it.

In Living Color

Once you've acquired a 24-bit-color board, you'll probably spend a fair portion of your computing time in 24-bit color. The old standard, 8-bit color, will begin to look about as sophisticated as a coloring book with a limited palette of crayons, and if you're working with photographic images, the detail and subtlety of 24-bit color will be hard to resist.

Nevertheless, I'm a pragmatist and I think you should be too. Besides the tips I've just provided, let me leave you with one more thing to consider: More is not always better. Consider that multimedia presentation you're putting together. Yes, it would be great to use photos as backgrounds when you play back your presentation on a 35-inch Mitsubishi monitor, but if the audience has to wait for those detailed images to load, which can take seconds on even the fastest Mac, you risk losing a sense of pace or, worse still, losing the audience. Although the people I know who are working in multimedia have installed 24-bit color in their machines, the two best presentations I've seen were done in 8-bit color. They were fast, they had snap, the colors were selected carefully to add life to the images, and the audience didn't have time to notice that the color wasn't the most subtle in the world.

If you do run out and buy a 24-bit color card, make sure you turn the added-color capabilities off occasionally and see what you can do with the lower-resolution settings. You might be pleasantly surprised. ☐

Contributing editor Thom Hogan has handed over the reins of Maccreations to his partner and is now an evangelist with GO Corp.



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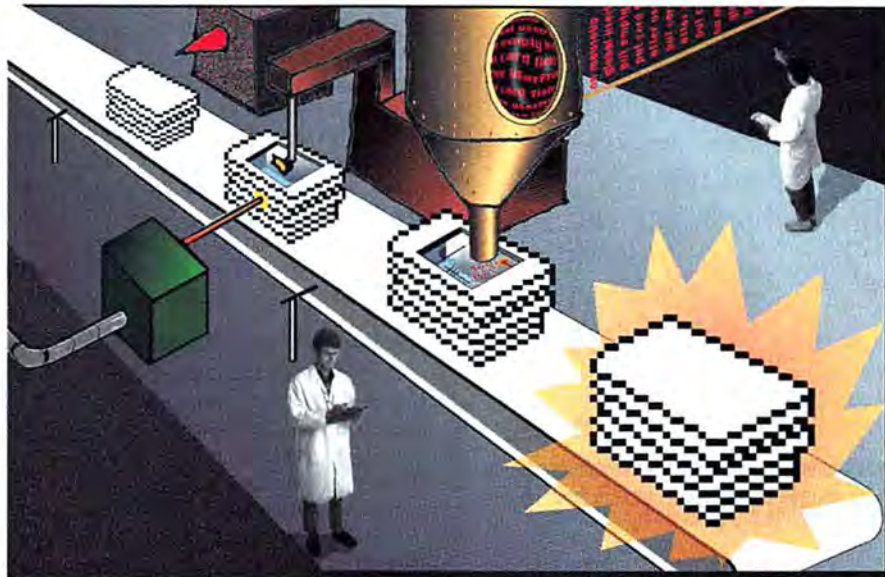
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Moving to HyperCard 2.0

Here's a compendium of gotchas that can turn HyperCard 1.2 stacks into mush under 2.0 — and how to fix them.

By Danny Goodman



Major upgrades to programming platforms can be messy, and the shift to HyperCard 2.0 has been no exception. Not only did the product's internal design change but so did the responsibility for its development and marketing — from Apple to Claris, which was then reabsorbed into Apple. Add to this jumble a new marketing strategy that makes HyperCard available in three ways: a version bundled with the Mac that includes a stripped-down Home stack, a couple of demo stacks, and a voice-recording stack; a \$49 upgrade consisting of five disks and an updated HyperTalk reference guidebook; and a \$199 Development Kit, which has everything in the \$49 upgrade plus a weighty set of manuals for HyperCard beginners.

However you view Claris' marketing strategy, those of us with HyperCard 1.2 stacks have a much more important chore to take care of: making those stacks work properly once we've converted them to HyperCard 2.0. This upgrade and earlier versions aren't 100-percent compatible, so problems may crop up with some stacks. Here are the most common problems you'll encounter when running old stacks under the new version of HyperCard and some tips on what to do about them.

Cleaning Up Your Expressions

Nothing is more puzzling than getting a HyperCard 2.0 script error on a line of HyperTalk that executed without the slightest hiccup under HyperCard 1.2. A common cause

is that the new HyperTalk compiler is not as lenient as the old HyperTalk interpreter when it comes to sloppy expressions. Two examples illustrate the point:

First, if a local variable (one that applies only within the handler in which it occurs) contains more than one line of information, HyperTalk 1.2 tries to make a valid expression out of the first text it finds in the variable. So if the first line of a variable named **stackData** holds the name of a stack and the second line contains, say, a number, HyperCard 1.2 allows the command **go to stack stackData** without a hitch. HyperCard 2.0 won't do this much work for you; you have to be more specific, as in **go to stack (line 1 of stackData)**.

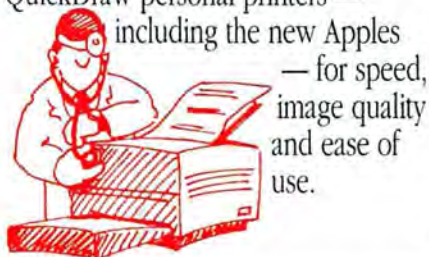
Another example: Suppose you're assembling a list of user parameters from fields on a preferences card. Under HyperCard 1.2, the handler (a handler is HyperTalk code that acts in response to a single message) in Example 1 works fine: It assembles a list by accumulating the contents of each field in a return-delimited list in the **userPrefs** global variable. HyperTalk 2.0, however, evaluates the **&** concatenation differently, making the return character part of the field's name. Because there is no card field with a name ending in a return character, you get the script error "No such card." To get around this, use parentheses (see Example 2) to help HyperTalk evaluate the expressions in the way you want.

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evaluation snafus you can run into. In fact, when a HyperCard 1.2 script breaks under HyperCard 2.0, this is the first possibility to explore. Check very carefully for arithmetic logic and precedence — often a pair of carefully placed parentheses can put HyperCard back on track.

You can also keep your expression evaluations safe for future enhancements to HyperCard by putting quotation marks around every object name — button, field, card, and so on — you mention in a script. Then, even if HyperCard 5.0 should add a new command or keyword with that name, your object references should be safe.

No More Constant Handlers

Because HyperTalk 1.2 happily accepts HyperTalk constants as names for handlers, such handlers occur in many existing stacks. However, HyperCard 2.0 doesn't let you use the following constants as handler names and messages: **down, empty, false, formFeed, lineFeed, pi, quote, return, space, tab, true, up, zero, one, two, three, four, five, six, seven, eight, nine, and ten.** If you try to use any of these constants as a handler name or message, you'll get script error messages such as "Expected end" or "Can't use keyword as a message." To fix this problem, rename the handler and the messages in the scripts (forexample, you might replace **On down** with **On doDown**).

New Default Field Style

A typical way for a script author to create a new field is to issue the **doMenu "New Field"** command. This command generates a default text field in the center of the card. You then specify various properties for the field, such as size, location, font, and font style. If you wanted the HyperCard 1.2 default style, however, you didn't need to set any properties for the new field. This causes problems in HyperCard 2.0, which has a different default style for new fields.

The default field style for new fields used to be *transparent*, meaning that it could contain text but any background object would also show through. Under HyperCard 2.0, the default style is *rectangle*, a style that is always opaque and has a 1-pixel black border. The resulting new field will look different (perhaps disastrously so) in HyperCard 2.0. If you want a transparent field, you'll have to

insert a line of HyperTalk to set the style of the new field to transparent.

Oddly, there is no change in the default field style if you create a new field by dragging the field tool (either manually or by script). In both generations of HyperCard, the default style for this method is transparent.

One last note about fields: A card or background with lots of fields is more sluggish in HyperCard 2.0 than in earlier versions. Avoid the lure of changing text styles arbitrarily and frequently within fields, because card-to-card navigation and text-field activation slows down. The bottom line? Keep it simple.

Getting Out of the Background

Another change in HyperCard behavior can mess up scripts that perform tasks in the background layer. Consider the handler in Example 3. Under HyperCard 1.2, this handler creates and changes the properties of the button in the background layer. Choosing the browse tool not only chooses that tool but also automatically sets background editing to false (so that you are editing on the current card). As a result, many authors (including me) got used to being able to use just one command (**choose browse tool**) to set the **editBkgnd** property to false and choose the browse tool. In HyperCard 2.0, however, choosing the browse tool does not, by itself, change the **editBkgnd** property. You must explicitly set the property in one of two ways — using either **set editBkgnd to false** or **choose browse tool with shiftKey**.

The second choice mimics the fact that if you manually click on the browse tool or press Command-Tab while holding down the Shift key, you will leave the background-editing mode.

Compacting Your Stacks

Even before you have a chance to convert a 1.2 stack to 2.0 (it's possible to run a 1.2 stack under 2.0 without converting it), you may encounter the script error message "Can't find menu item 'Compact Stack'." What's going on here?

Some stack authors build in routines that compact a stack according to some time interval (say, once a week) or a calculation based on a stack's **freeSize** property (for example, if the size of the free space is 20 percent larger than the stack size). Compacting a stack rearranges the current stack on the disk, removing

Example 1: HyperCard 1.2

```

on mouseUp
  global userPrefs
  put empty into userPrefs
  put card field "Last User" of card "Preferences" & return -
  after userPrefs
  put card field "High Score" of card "Preferences" & return -
  after userPrefs
  put card field "Last Update" of card "Preferences" & return -
  after userPrefs
end mouseUp

```

Example 2: HyperCard 2.0

```

on mouseUp
  global userPrefs
  put empty into userPrefs
  put (card field "Last User" of card "Preferences") & return -
  after userPrefs
  put (card field "High Score" of card "Preferences") & return -
  after userPrefs
  put (card field "Last Update" of card "Preferences") & return -
  after userPrefs
end mouseUp

```

Example 3: HyperCard 1.2

```

on mouseUp
  set editBgnd to true
  doMenu "New Button"
  set loc of last background button to 30,50
  set name of last background button to "Click Me"
  choose browse tool
end mouseUp

```

any unused space so that it fits into the smallest possible space.

Although compacting regularly is highly recommended, a stack that has not yet been converted to HyperCard 2.0 simply doesn't have the Compact Stack menu item on the File menu. In its place is the Convert Stack menu item. Because compacting is dependent on the data structure of a stack, HyperCard 2.0 cannot compact a 1.2-generation stack until the stack's data structure has been converted to the 2.0 format. After you've converted the stack to 2.0, the Compact Stack menu item returns and the stack's compact routine should run fine.

Finding 'Missing' Text

Some users have fretted over the apparent disappearance of text in fields after converting a stack to 2.0. Figure 1a

shows text in a HyperCard 1.2 field. To encourage users to keep entries in this field to a maximum of four characters, the script author carefully sized the field so that the rectangular border allowed just a few pixels of white space to the right of the last character.

When this stack is converted to HyperCard 2.0, however, it looks as though the last character has been cut off (see Figure 1b). The full text is still there — it's just wrapped to the next line. If you widen the field a couple of pixels, all the characters will return to the first, visible line (for best results, widen these fields *after* converting the stack). Although some word-wrapping oddities of HyperCard 1.x have been corrected in 2.0 (for example, parentheses and quotes now stay with their associated words), a field still requires several pixels of white space between

**System 7.0-Compatibility Chart Now On-Line**

System 7.0 now has its own message section in Zmac's MacUser Forum. Users and editors will be updating an on-line copy of a System 7.0-compatibility chart with information on what works and what doesn't under Apple's new System software. Don't waste time testing software on your own — join our expert on-line compatibility lab. Simply type GO ZMC:MACUSER, and download the file CMPAT7.TXT from Library 1 (Special Reports).

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2. Set up your modem and telecommunications software with the following standard Mac settings: 8 bits, one stop, and no parity.

3. Dial your local access number. When connected, press Return. You'll see the following prompts on-screen. Your responses are printed in boldface type.

Host Name: **CIS**

User ID: **177000,5200**

Password: **Z*MAC**

Agreement Number: **Z12D9014**

4. You will then be prompted for additional information, including a credit-card number for billing purposes. If you cannot bill to a credit card, call the CompuServe customer-support line listed below. Sign-up is free, but normal access time is billed at \$12.50 per hour.

5. Call CIS again with your user ID and password. A new password will arrive in the mail within ten days.

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POWER PROGRAMMING

the last character and the right edge of the field rectangle for the character to be visible on that line.

Sound and Vision Problems

Depending on what kind of Mac you use, the speed of visual effects may differ under HyperCard 2.0. You can set a stack's visual effects to slow, very slow, fast, or very fast. Except for the very fast speed (which works as fast as your Mac's CPU chip does), these speeds have been normalized across all Macs in HyperCard 2.0, so that visual effects will have roughly the same impact when run on a Mac Classic as on a IIfx. Because these speeds have been standardized to the slowest common denominator, if you use anything faster than, say, a Macintosh SE, you'll probably notice slower visual effects when the stack is converted to HyperCard 2.0 than you did under version 1.2.

However, you can speed up these effects so that they're closer to what you're used to. To do this, start by using the

searchScript command from the Message Box to let a helpful utility handler in the Home stack find the locations of the Visual Effect command. Show the Message Box by pressing Command-M. Thentype **searchScript "visual"**, and press Return. If any object's script contains this command, the script-editor window will open to display the script. The script editor already knows what text you searched for with **searchScript**, so you can simply press Command-G to issue the Find Next command within that script. The search will find a line that looks something like this: **visual effect wipe left** (or whatever is being applied to the visual effect). To the end of the line, add **fast** or **very fast**, as in **visual effect wipe left fast**. Press Command-G in this script until you hear a beep, which means there are no more visual effects in the script. Press the Enter key to save the script change, and close the script window.

As for sound, if you're running System

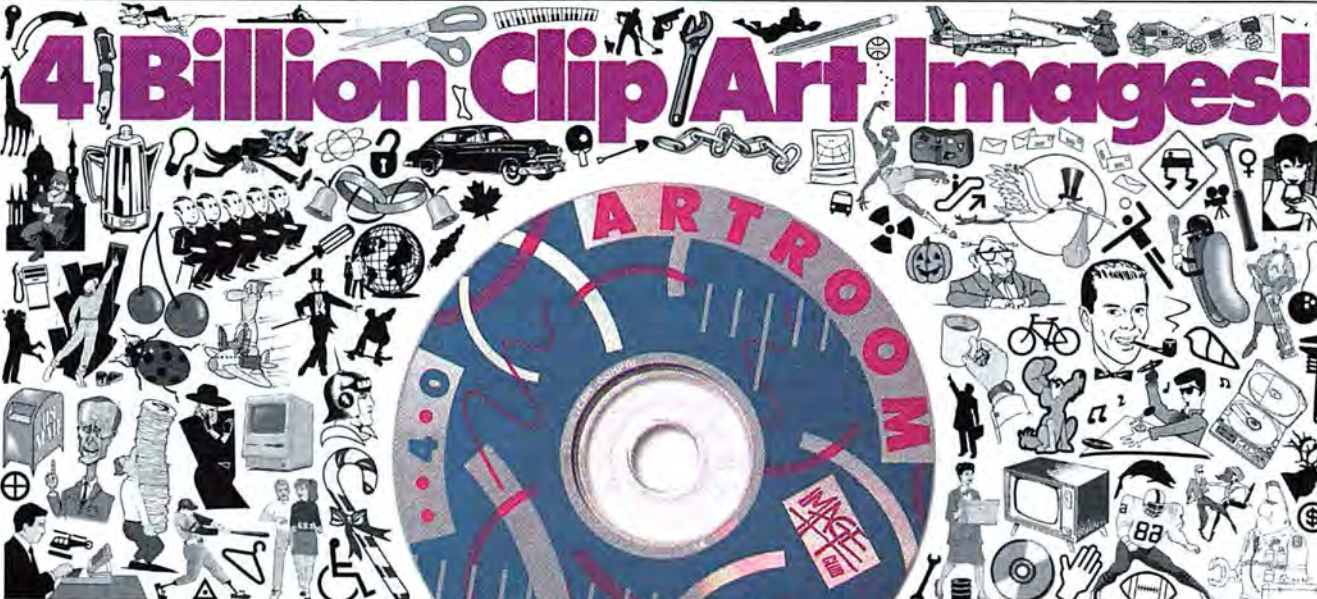
6.0.7 or later, you must use HyperCard 2.0 to ensure trouble-free sounds when using the Play command. In addition, existing sound XCMDs (external commands), such as those provided in Farallon's HyperSound Toolkit, need to be upgraded to work successfully with HyperCard 2.0 (you need to get the upgrade from the company that created the sound). You may get some sound out of the old XCMDs but not consistently.

A note on XCMDs: Most existing XCMDs work in HyperCard 2.0 just fine. The ones that cause the most problems are those that create their own windows or are dependent on HyperCard 1.2 stack data structures. The former need to be redesigned around the new XCMD structure and libraries (both available from Claris); the latter need major overhauls.

Compiler Ills and Thrills

Under HyperCard 2.0, a handler is compiled before it runs (earlier versions did not include a compiler). The compiled

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Example 4: HyperCard 1.2

```
on mouseUp
  if fld 1 is "Yes" then
    -- 20
    -- lines
    -- of
    -- Yes
    -- Stuff
  else
    -- 30
    -- lines
    -- of
    -- No
    -- Stuff
  end if
end mouseUp
```

Example 5: HyperCard 2.0

```
on mouseUp -- compiles in either case
  if fld 1 is "Yes" then
    doYesStuff
  else
    doNoStuff
  end if
end mouseUp

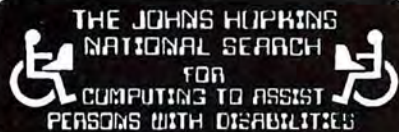
on doYesStuff
  -- only this 20-line handler
  -- compiles when "Yes"
end doYesStuff

on doNoStuff
  -- only this 30-line handler
  -- compiles when "No"
end doNoStuff
```

version stays in memory (it is not saved to disk) as long as HyperCard is still running and the memory isn't needed for something else (painting tools or other compiled handlers, for example).

Very long handlers that operate normally under HyperCard 1.2 may overload the compiler under 2.0. The symptoms are frustrating, because you get script error messages that make absolutely no sense

(for example, an offset function that claims to have too many arguments, when the script plainly shows two valid arguments). The problem is that the compiler has run out of internal working memory



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Figure 1: Finding 'Missing' Text

1a Enter Year: 1991

1b Enter Year: 199


Figure 1: In Figure 1a, the field was carefully sized so that the rectangular border allowed room for no more than four characters. When this stack is converted to HyperCard 2.0, it looks as though the last figure has been cut off (Figure 1b). The full text is still there — it's just wrapped to the next line. You need to widen the field a couple of pixels so that all the characters return to the first, visible line.

and chokes on the long handler. In the case of long handlers, the time required to compile is small but noticeable as a slight delay if you're used to 1.2 execution speeds. Also, once the handler has been compiled, it might occupy a comparatively large chunk of memory. To overcome this, you have to divide the long handler into smaller pieces. As painful as this may sound, the exercise is good practice for getting the best performance out of the HyperTalk 2.0 compiler.

Here's an example: If HyperCard 2.0 tried to run the **mouseUp** handler in Example 4, it would first try to compile the entire handler, even though it needs only the part of the **if . . . then** construction that is valid at run time. If you divide the handler into three components, as in Example 5, the compiler has to do less work: It compiles the smaller **mouseUp** handler and just the one conditional handler it needs. As a result, compile time is reduced and the smaller compiled chunks are less likely to be pushed out of memory

by another handler's compilation.

By limiting individual handlers to 35 or 40 lines of HyperTalk code, you quickly train yourself to modularize your scripting. **If . . . then** branches are excellent candidates for breaking into separate handlers. Try to find names for these subhandlers that identify the action they perform so you can better understand the structure of complex scripts and find common code that can be shared and called by more than one handler.

Despite what seems to be a long list of incompatibilities (there are other, less common ones too), HyperCard 2.0 has retained a great deal of compatibility with earlier versions. Some features that weren't quite right in the very beginning had to be fixed eventually. We're just paying the price now rather than later. 

Danny Goodman is the author of *The Complete HyperCard 2.0 Handbook* (Bantam: New York, 1990) and cofounder of Concentrix Technology, a publisher of modular, customer-modifiable software.

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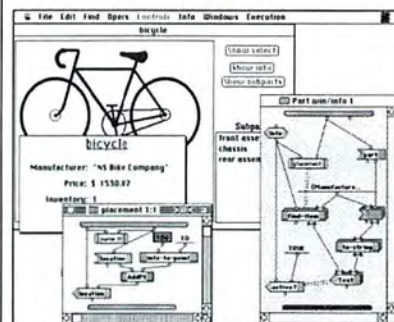
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Original:
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default
Input resolution:
150 dpi
Size: 1201K
Output Resolution:
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Line Screen: 150 lpi
Color Correction:
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Silverscanner

Original:
8 x 10 color print
Brightness level:
default
Input resolution:
150 dpi
Size: 1220K
Output Resolution:
200 dpi
Line Screen: 150 lpi
Color Correction:
None



When it comes to selecting the right scanner, be forewarned. There is a difference you can see in black and white. And color. Just look at this comparison between the La Cie Silverscanner and the Microtek 300ZS. Both images were scanned at default settings with no corrections. This entire ad was then created and separated using Adobe Photoshop, Quark XPress 3.0 and a Linotronic 330.

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You can also contribute tips electronically via Zmac, the on-line service for MacUser. Send them to Gregory Wasson at 72511.36. Be sure to include your full name and mailing address along with the text of the tip.

Compiled by
Gregory Wasson

PageMaker

Getting the spacing consistent between several repetitive elements, such as photos and their captions, throughout a multipage publication can be a real chore — but not if you use this PageMaker trick:

1. When setting the style for a caption or other repeating text element, go to the Rules dialog box, which you access by selecting Paragraph on the Type menu. Check Rule Above Paragraph, and set Line Style to None on the pull-down menu (this gives you an invisible rule above the text).

2. Next go to Options, and type the desired number in the Top box for the amount of spacing you want between the text and the invisible rule. For example, if you're working in 12-point type, an 18-point space gives you 6

points between the text block and the rule — which translates to the bottom of the graphic element.

3. When you drag the text block to position it, the invisible rule above the text will enlarge the text box (shown as a dotted line), according to the amount of space you entered. Line up the top edge of the text box with the bottom edge of the graphic (see Figure 1). This will give you consistent spacing between all captions and related graphics.

This trick also works if the invisible rule is set below the text block (which lets you place the text above the graphic) or if the text block is rotated (for example, for a photo credit on the side of a photo).

Sam Mattes
Indianapolis, IN

Tip of the Month

Word 4.0

To use Word's indexing feature, you must mark each word that you want to index with .i. in front of the word and ; after it. This is extremely time-consuming, especially if you want to index a word every time it appears in a document. Here's an easy way to add hidden .i. and ; characters around all occurrences of a given word in an open document:

1. Index the first instance of the word as you normally would. Choose Save As from the File menu.

2. In the Save As dialog box, click on File Format and choose Interchange Format (RTF). Click on OK.

3. Give the RTF document a name, and save it. You'll see a new version of the file with all kinds of strange control codes embedded in it (see Figure A).

4. Find the first instance of the word that you indexed normally. It will be surrounded by codes that might look something like this: {\v {\xe\pard\plain\s240 Indexword}}.

5. Select the word and all of this index code — which always starts with {\v and ends with }} — and copy the selection to the Clipboard. Next place your insertion point after this word

and all the code that surrounds it.

6. Choose Change (Command-H) from the Utilities menu. Type the word you want to index into the Find What: box, and then paste the contents of the Clipboard into the Change To: box.

7. Click on Start Search (choose No when Word asks you if you want to continue the search from the beginning of the document). This will add the correct index codes at the beginning and end of each occurrence of the word you want to index. Repeat this process for all words you want to index.

When you've finished, save and close the RTF document. When you reopen the document, Word will ask, "Interpret RTF text?"; click on Yes. The document will then appear in normal format with all the relevant entries properly indexed. You can verify that all the words have been correctly labeled by choosing Preferences from the Edit menu and toggling the Show Hidden Text button on. You can then create an index for the document as normal, using the Index command, on the Utilities menu.

Christopher Hvid
Victoria, British Columbia
Canada

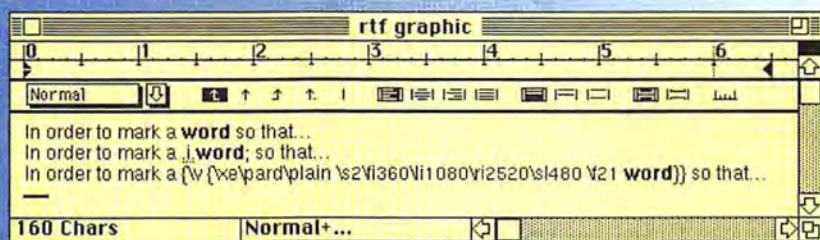


Figure A: Adding formatting to words you want to index in Word 4.0 can be time-consuming, because you have to mark each word you want indexed (as on the second line of this figure). By creating an RTF version of your document (which creates codes such as those in the third line), you can add formatting to any given word with the Change command.



Photo Caption:

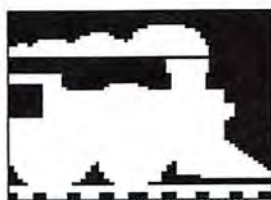


Photo Caption (spaced)

Figure 1: You no longer have to fiddle with page guides when you want to place a caption below a graphic in PageMaker, as in the example on the left. Using the Rule Above Paragraph option, you can enlarge the caption's text box and use its upper edge as a guide for placing the caption (right).

ImageWriter

If your ImageWriter printer is more than two years old, it will benefit from a quick tune-up. All you need do is turn off the power, remove the ribbon, and clean the pin mechanism. Here's how:

1. After removing the ribbon, locate the white plastic retaining clip, which is to the

right of the printing mechanism. Gently pull the clip to the right so that you can lift the assembly up and out of the carriage.

2. Using a general-purpose cleaner on a cotton swab, carefully clean any ink residue from around the pins. On the underside of the unit is a small cutout that allows lubrication

of the pins. You can add a small amount of lubricant (such as WD-40) here.

3. Gently replace the assembly and the ribbon. You're now ready for another two years of printing.

James Dierberger
Hebron, CT

MacWrite II

I've taught English as a second language for many years and have discovered a simple way to use my Mac to make flash cards. All you need is a program that prints two columns on a page (or you can do it the hard way and use tabs). My instructions are for Claris' MacWrite II, but sophisticated word processors—such as Word, WordPerfect, or Nisus—work just as well.

1. Create a format with two columns. Make sure that if the page were folded down the

middle, the columns would be situated on either side of the crease.

2. Type in the words or phrases in your target language—let's say Spanish—in the left-hand column.

3. Do a column break. Directly across from each Spanish word or expression, type the equivalent in English. Make sure that the equivalents are directly opposite each other, on the same imaginary horizontal line (see Figure 2).

4. Increase the space between the selections, either by double-spacing (pressing Return twice) or by increasing the line spacing. This step isn't essential, but the results look better.

5. Print out the list. You'll have a column of foreign words and phrases on the left and their equivalents in English on the right.



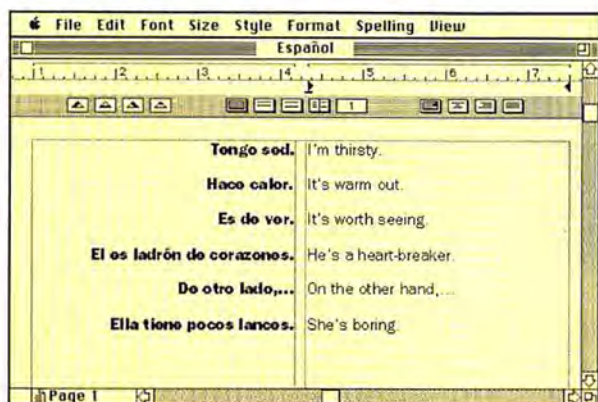


Figure 2: *¿Habla español?* With a few easy steps, you can use your word processor to print flash cards for studying any subject.

6. If your printer has a sheet feeder, turn the paper over and run it through the printer again, head first, printing the other side. If you have a continuous-form printer, make sure the paper is rolled to exactly the same point before printing each side.

7. Cut the paper vertically up the middle. This yields two strips, each with English expressions on one side and their equivalents in the other language on the opposite side. Put one strip away to use if you make mistakes in the next step or if you later lose some of the

printed phrases and want to make a new set.

8. Trim off all the excess white paper.

9. Cut the printed words and phrases apart, and mix them up.

10. Whenever you want to test yourself, review, or learn new expressions, just pull a slip of paper out and look at one side. After you've tried the translation, turn the paper over to see if you were correct.

Billy Ray Boyd
Amsterdam
The Netherlands

Printing Labels on Laser Printers

Anyone who has ever fed a sheet of labels into a laser printer has feared that somehow a label is going to wreak havoc by peeling off its backing and adhering to the innards of the printer.

I noticed recently that if you print and remove a single label, the remaining sheet starts to curl at that end, increasing the likelihood that the sheet will jam the next time it's fed into the printer. The solution is to print from the bottom of the sheet, not the leading edge. Most label-printing utilities allow you to specify which label to begin printing so that you can—theoretically—use an entire sheet, one label at a time, starting anywhere on the sheet. Don't use the default setting of the first label on the sheet, but rather switch to the last one at the trailing end of the sheet. That way, even if the sheet starts to curl, the leading edge will remain straight and you'll have fewer problems each time you feed it into the printer.

Owen Linzmayer
San Francisco, CA



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Questions, anyone? Here's where to get answers from the experts. Bob LeVitus is the author of the best-selling Dr. Macintosh. Andy Ihnatko isn't. But he knows a lot about the Mac, and he's got a heck of an attitude. Together, they're ready to answer your questions about everything Macintosh.

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Don't want to wait for an answer? Post your question on Zmac, MacUser's on-line service, and get a reply from Bob, Andy, or one of the other MacUser experts.

**By Bob LeVitus and
Andy Ihnatko**

Downloading Mac Files to PCs

Andy: Before proceeding with this month's festivities, here's an update on a topic we discussed a few months ago. A reader asked if it was possible to download Mac files onto a PC and then transfer the files to a Mac via TOPS (see "Transferring Fonts from PCs to Macs" in our April '91 column, page 253). I said that it's generally necessary to un-MacBinary-ize the file after transfer, with a utility such as MacBinary to Mac. One of our alert readers — Bill Davies of MacNexus (the Macintosh users' group in Sacramento, California) — has another solution:

"Here's another workaround: Compress the files with StuffIt Classic or Compactor — anything that creates *only* a data fork (this means that self-extracting archives don't qualify, because they also create a resource fork containing the self-extractor code). A StuffIt or Compactor archive uploaded to a DOS machine works fine when you get it back to the Mac. At the very worst, if the header is screwed up and there is a generic document icon, the .SIT suffix should be enough to clue most people to set the file type and creator to SIT! (using a utility such as DiskTop) if that information was lost in the transfer."

A keen idea, to be sure, and it should work with most BBS files (as a general rule, files are compressed before they're uploaded). For files without a .SIT (StuffIt) or .CPT (Compactor) filename extension, however, you probably have to un-MacBinary-ize the file as recommended in the April column.

U.S. Government Forms on the Mac?

Q. I need a program for filling out the U.S. government Standard Employment Form 171, which is required to apply for a government job. Is there a program for filling out this form? If the U.S. government allows programs such as MacInTax and TurboTax to use IRS tax forms, then surely it must be OK to duplicate the Standard Employment Form.

W. Robert Lohan
Springfield, VA

Bob: Get a copy of Claris' SmartForm Assistant, and Claris' customer support ([408] 727-8227) can provide you with a copy of the U.S. Government Standard Employment Form 171 to use with it.

Andy: Given the state of the economy, I imagine that that template's in pretty high demand these days.

Dead Mice Aren't Much Fun

Q. One of the most irritating software crashes occurs when the mouse becomes paralyzed. The keyboard continues to work, the screen is still functioning (clocks and screen savers work fine), and you can continue to direct the Mac with keyboard commands, but the blinking cursor or arrow controlled by the mouse doesn't move.

Why does this happen? Is there any utility that can bring the mouse back to life?

Steve Charnovitz
Baileys Crossroads, VA

Andy: Several possible explanations come

* ... But Were Afraid to Ask

Who ever said there was such a thing as a stupid question? OK, my chem professor did, but he said it only to me. The only stupid question is the question you don't ask. Here at Help Folder, we don't care how simple you think a question is — just send it in! (However, if it's such a simple question that you're embarrassed to even ask it, we can conceal your identity by crediting the question to a deceased historical figure.)

Q. I'd like your opinion on a little gizmo I saw at an electronics fair last month. It was a tool like a big paper punch for cutting a hole in a regular-density (800K) diskette, allowing it to be formatted as a high-density (1.44 megabyte) disk.

The guy selling it said that all diskettes are the same except for the hole and that I'm just throwing money away by buying "real" high-density disks. The tool cost \$30, so I didn't bite, but I'm curious nonetheless. Do these things actually work?

Colley Cibber 1671 – 1757
(English Poet Laureate, 1730 – 1757)

Andy: Did this booth also hawk miracle stain eradicators and eyeball whiteners? They work

about as well as the disk nibbler you describe! *Technically* it works. Cut a hole in a new 800K disk and put it into your drive, and your Mac will see that hole and format the disk for 1.44 megabytes of storage.

The problem is, you can bamboozle your Mac pretty easily, but Saint Feynman, patron saint of electromagnetism, isn't so gullible. The magnetic coating on a regular-density disk contains big, clunky particles that just can't reliably maintain a high-density data image. Although the disk *might* format and *maybe* you can put some data on it for a while, the day will come when, after inserting that disk, you'll be greeted by a festive unreadable-disk message. Kiss your data bye-bye, son, and don't say I didn't warn you.

It doesn't end there either. Defective disk nibblers can leave sharp little bits of plastic inside the diskette, which then scratch your drive's read/write heads to the tune of \$400. If you want to save dough, buy generic disks rather than name-brand ones (I've been using generics for years and haven't noticed any difference), and leave the disk nibblers alone.

to mind, so let's start at the beginning. A lot depends on whether or not your Macintosh has ADB (Apple Desktop Bus) connectors for the mouse and the keyboard. Mouse deaths occur far more frequently on ADB machines, because the mouse is just a single element in a somewhat fragile chain of devices.

There are many ways for the mouse to get lost in the chain. You may have too many devices daisy-chained together; if you have more than three devices connected at once, there might not be enough juice in the bus to keep track of all those mice, trackballs, and keyboards. Or perhaps your mouse was disconnected from the bus and reconnected with the Mac still turned on — once an ADB device has been removed from the chain, the Mac usually can't find it when it's plugged in again. Or perhaps one of the ADB connectors on the chain is dirty: You can clean it (carefully) with isopropyl alcohol.

It's also possible that something has broken (most likely the mouse, the ADB connector, or the device it's plugged in to). Another possibility is that the program you're running isn't compatible with an INIT or cdev that works with your mouse, such as the Mouse cdev or the cdevs that come with some third-party pointing devices. If you have a third-party device, call the manufacturer and ask if there have been similar complaints.

If you have a Mac that doesn't use ADB (the Mac Plus or earlier), then the list of potential problems is somewhat narrower. Hardwarewise, it might be a dirty mouse connector or a loose connection in the mouse itself. In these cases, all you can really do (short of — *shudder* — taking the Mac to your dealer for a checkup) is clean the mouse connectors or borrow a pal's mouse and see if it works on your Mac. Some

software can clobber the mouse on the Plus too. One such error is so common that Greg Dudek wrote a shareware Fkey for Mac Plus owners called Defrost that can (sometimes) bring your mouse back to life after it freezes on-screen.

If mouse-freezing is so common on your Mac that it really cramps your style, take some preventive measures. Install the Easy Access INIT that's part of Apple system software. Once it's installed, press Command-Shift-Clear at any time and Easy Access turns your numeric keypad into a mouse (the 8 key is up, 2 is down, and so on — the details are in your system-software manual). Easy Access works well enough for you to calmly save all your work if the mouse freezes, quit the current application, and politely restart your machine (see Figure 1).

Bob: I have only one thing to add (and I know we've said it before, but it bears repeating): Never plug in or unplug an ADB device without first shutting down your Mac. If you do, the mouse freezes might occur as a result of a damaged ADB chip. If that's the case, a trip to an Apple dealer for repair is necessary.

Keeping a LaserWriter Running

Q. I have a Mac SE, a LaserWriter IISC, and a recently acquired external hard drive. The dealer told me that whenever I start up my system, I should turn on the hard drive first, the LaserWriter second, and finally the SE and that I should keep the LaserWriter running while I'm using the system.

Is this correct? Before I got the hard drive, I often used the SE without turning on the LaserWriter, and everything seemed to work fine. I am concerned about wasting energy, because I often have my computer on for several hours without printing anything. Can

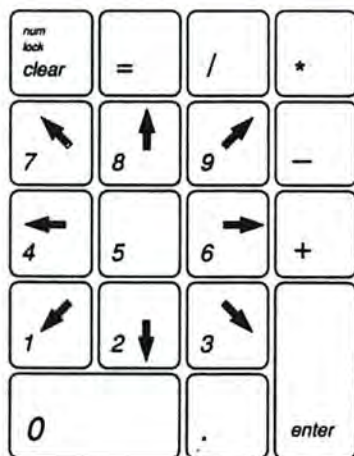
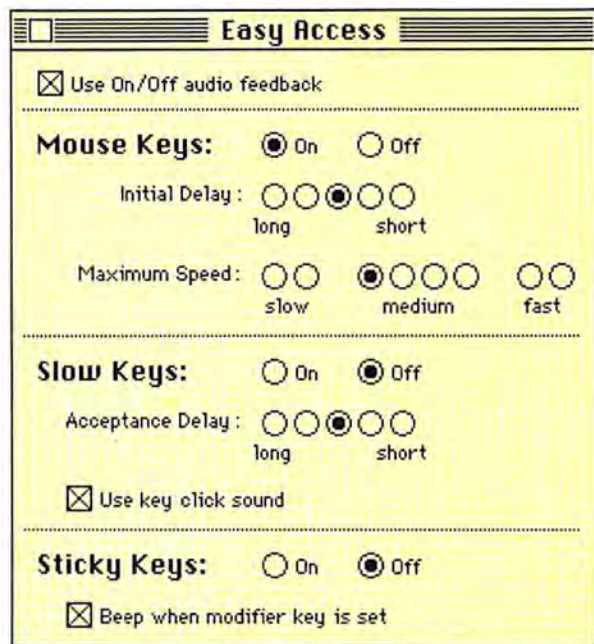


Figure 1: The Easy Access INIT (above) that is part of Apple system software lets you turn your numeric keypad into a pseudo-mouse that controls the cursor (left). If your mouse freezes, turn on Easy Access by pressing Command-Shift-Clear, save your changes, quit, and restart your Mac.

I turn the new system on and leave the LaserWriter off? And is it detrimental to switch the LaserWriter on and off several times in the course of a work session?

Gloria Baciewicz
Tuscaloosa, AL

Bob: Well, your dealer gave you an answer that's half right and half hogwash. The correct part is that you should turn on your external hard drive and allow the disk enough time to spin up to speed before turning on your Mac. The hogwash part is that you must always keep the LaserWriter running.

There is no good reason why your LaserWriter needs to be on when you are using the Mac.

I never turn my laser printer on until I need it. Then, depending on whether I expect to do more printing, I either turn it off or leave it on. Some days it never gets turned on, and other days it's turned on and off several times.

I don't think turning your printer on and off a few times a day can harm anything, and it might even save a bit of energy.

Andy: Sure, if we're talking only two or three times a day, there's probably no problem,



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but I wouldn't want to switch any piece of equipment on and off much more than that. Cycling a power supply (nerd-speak for "switching the thing on") causes a certain amount of stress on any circuit, and if you really go overboard, you can shorten the life of the printer. Admittedly, we're only talking about taking six months (at the most) off your printer's eight-year life span, but it's something to think about.

During two blissful weeks last October when I had a borrowed laser printer on my desk, I did pretty much as Bob does — switched it on just before printing and switched it off soon thereafter. I didn't care so much about wasting energy; I did it to keep the fan from drowning out my Carl Stalling CD. Don't issue the Print command until you turn the

printer on, and wait for its "ready" light to come on, though.

Replacing Formats

Q. Is there any way to globally find and replace fonts or formats in Word 4.0? I want to be able to change underlined text in a file to italicized text.

Steven Johnson
Bronx, NY

Bob: Well, Word can almost do what you ask. There are two ways to do it, but neither is convenient. The first is to convert the document into RTF (rich text format). To do this, choose Save As from the File menu, click on the File Format button, and choose Interchange format (RTF). When you save the document, it appears on-screen complete with the formatting code. Because the code for underlined text is `\u1` and

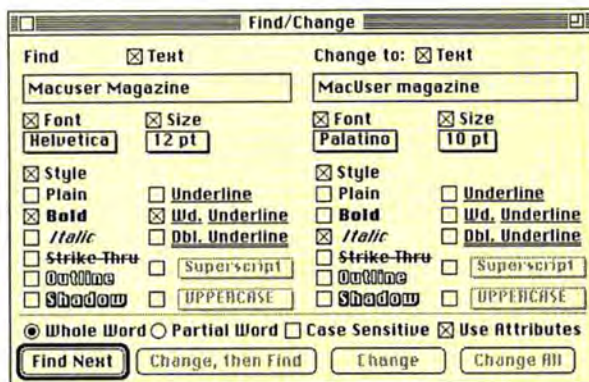


Figure 2: Global style changes are a breeze in MacWrite II. To change all underlined text to italic, just fill in the Find/Change dialog box as shown and click on the Change All button.

the code for italicized text is `\i`, you can globally change the formatting by using the Change command (Command-H). In the Find What box, type `\u1`; in the Change To box, type `\i`; and then close the

document and save your changes. When you reopen the document and Word asks if you want to interpret RTF text, click on OK. All underlined text is now italicized in the new (untitled) document.

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The other way to do this is to use the obscure (at least I'd never heard of it before) Find Format command, described on page 60 of the Word manual. It lets you search for underlined text, but you have to change it to italic manually.

Here's how it works: To find each occurrence of underlined text, first select an underlined character. Invoke Find Formats by pressing Command-Option-R, and the program finds and selects the next occurrence of underlined text. Change it to italic by choosing Italic from the Format menu (or type Command-Shift-I). To find the next occurrence of underlined text, choose Find Again from the Utilities menu (or type Command-Option-A).

This procedure isn't global; however, it does what you want fairly easily. If global-format

changing is important to you, you should know that other word processors do it faster and more easily. MacWrite II, for example, does it with a few simple selections in its Find/Change dialog box (see Figure 2), and FullWrite Professional works similarly.

Andy: Don't forget about Nisus, the Ninja word processor favored by folks who need to automate lots of repetitive editing and reformatting tasks.

Ask yourself how much pain Word's lack of a Change By Style feature causes you; if it's really affecting your quality of life, think about changing word-processing programs.

What to Do with 256K SIMMs

Q. I recently upgraded two Macintosh Pluses to 2.5 megabytes of RAM. This leaves four

256K SIMMs (removed from the Macs) sitting around without a home. My employer recently purchased a Macintosh SE/30 with 1 megabyte of RAM. Can I hand over the 256K SIMMs for the SE/30? I want to know whether the Mac Plus SIMMs are fast enough for the SE/30. One of the Mac Pluses was purchased in October 1989 and the other in the spring of 1990.

Richard Goodman
Los Angeles, CA

Andy: The SE/30 has no problem accepting 256K SIMMs, but they must be no slower than 120 nanoseconds. Check the numbers stenciled on the SIMMs you removed from the Pluses. Usually the last couple of digits are a clue about a SIMM's speed. The memory I removed from my Plus last year reads 424256-10, which

should mean 256K, 100 nanoseconds. I'm willing to bet that the SIMMs you removed are fast enough, but you should double-check 'em just to be safe. You should also make sure that all four SIMMs have the same speed. If one pair is 120 nanoseconds and the other is 100 nanoseconds, you won't be able to use the four of them together in the SE/30 — at least not in the same memory bank.

Loose Juice

Q. I'd like to know about surge protectors before buying my first Mac. What's the best kind of surge protector to buy? I've noticed that prices range from less than \$30 to more than \$200. A technician at a repair shop said the best surge protectors use silicon diodes, which have a reaction time of

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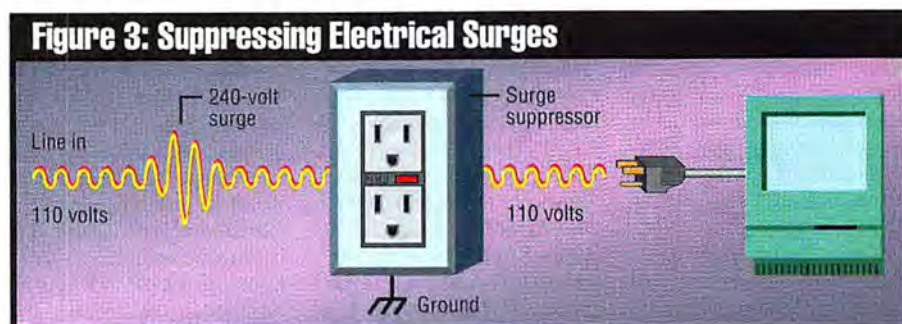


Figure 3: Surge suppressors plug into normal electrical outlets and are intended to protect your Mac from electrical surges. The suppressor acts as a filter, so that only the correct current goes to your electrical equipment.

5 billionths of a second and a clamp level of 220 volts. This technology apparently is superior to that of the standard MOVs (metal-oxide varistors) in all other surge protectors, which react too slowly and clamp at about 500 volts. What's your opinion?

Robert Joy
Beaverton, OR

Andy: Surge protectors are

designed to protect electrical equipment — such as your Macintosh — from sudden surges of electricity (see Figure 3). You might find one very useful if you've been experiencing power problems — if your power cuts off suddenly, for example, or if you have an old power system and have been experiencing sudden electricity cuts. With that

said, I'm going to hand over the rest of this discussion to Lee Thé, a *MacUser* senior editor who knows his surge protectors.

Lee: Surge suppressors get hyped a lot. To avoid getting burned, make sure that both the packaging and the product carry the UL (Underwriters Laboratories) 1449 trademark (1449 refers to the UL surge-

suppressor test). Counterfeit UL trademarks on some surge suppressors usually lack the 1449 designation.

Also, look on the packaging for the designation "UL Listed 1449 Suppression Voltage L-N 400/L-G 400/N-G 400," which means that the suppressor clamps at 400 volts when power surges across the line, neutral, and ground wires of

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the circuit. This is appropriate for Macs and their peripherals. The best UL rating, 330 volts, isn't mandatory.

The response time needs to stay at less than one millisecond, and most — if not all — UL 1449 suppressors are this fast. Buying a faster suppressor is like putting premium fuel into an automobile that's rated for regular. Surge suppressors cost from \$50 to \$100 (depending on features), and you can find them in electronics stores.

No surge suppressor works against direct lightning strikes — for that, you need a surge arrestor. Your local power company can probably install one on the line leading into your home or office for less than \$300.

Preprinted Paper and the LaserWriter

Q. What are the rules about using preprinted paper, such as paper that is offset-printed or copied on a copying machine, in my LaserWriter IINT? Is there a possibility that ink or copy toner can come off inside the printer and damage its internal parts? I understand that you shouldn't use paper that has been printed with thermography (raised lettering), because the heat generated by the printer can melt the ink, which can cause problems. Is there anything else I should know?

Kevin Hawkins
Phoenix, AZ

Bob: I think I know the answer, but because a mistake can be costly, I asked Apple for its official position. Here's what I was told:

"The reader is correct about paper that has been printed with thermography. Depending on the chemical makeup of the ink, when the paper runs through the printer's fusing process, it tends to melt and can damage the fusing unit. It is better to be safe than sorry: Letterhead or other paper

printed with thermography is not recommended with any laser printer."

There you have it. On the other hand, Apple says you can use most offset-printed, precopied, or colored paper in a laser printer. If you're not sure whether you should use a certain paper, Apple recommends that you consider the following characteristics:

•**Colored paper.** Don't use paper with a colored coating that was added after the paper was produced, because the pigments used on the paper might not be able to withstand the 392-degree temperature of the printer's fusing process. (You should also keep in mind that colored paper should be the same quality as regular photocopy paper.)

•**Offset-printed paper.** To avoid problems with offset-printed paper, make sure the inks used are heat-resistant and will not melt, vaporize, or release hazardous emissions when subjected to the printer's fusing process. Whoever did the original printing should be able to help you in finding out about this.

•**Paper that has been run through a copier.** Copiers use the same electrophotographic process as a laser printer does, so running copied paper through shouldn't be a problem. Remember, however, that depending on the makeup of the copier's toner and the LaserWriter's cleaning process (which scrapes excess toner off the paper), you may get toner droppings in the bottom of your printer.

To be safe, Apple says, you should avoid using the following in your printer: glossy paper, heavily textured or embossed paper (laser printing doesn't adhere as well to this kind of paper), carbonless or chemically coated paper, and paper and ink that are not compatible with the heat and pressure of the printer's fusing process. ☐

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RS#	ADVERTISER	PAGE	RS#	ADVERTISER	PAGE
61	Abaton	43	358	Jasmine Technologies	216
154	Abaton	5	387	Kensington	107
88	Advance Business Center	267	386	Kensington	235
100	AEC Management Systems, Inc.	82	388	Kensington	25
183	Aladdin Systems, Inc.	4	415	La Cie Limited	108-109
133	Alimed	251	414	La Cie Limited	228
N/A	Alliance Peripheral Systems	270-271	171	LaserMaster Corporation	211
75	ALSoft, Inc.	159	176	Liberty Systems	194
16	Altsys Corporation	218	360	Mac & MORE, Inc.	248
N/A	America Online	50A/B	N/A	MacAvenue	151-154
N/A	Apple	103	77	MacCenter	269
N/A	Apple	105	N/A	MacConnection	60-69
70	Applied Engineering	186	418	MacDepot	247
89	Articulate Systems, Inc.	28	96	MacFriends	203
37	Asanté Technologies	22	97	MacFriends	219
134	Bitstream	178	98	MacFriends	215
N/A	Bottom Line Distribution, Inc.	250	162	MacLand	252-255
42	CalComp	88	137	MacProducts USA	246
43	CalComp	88	46	MacSource	251
365	Calera Recognition Systems	85	31	MacTel Technology Corp.	264-265
370	Cambridge Computer (ERI Direct)	251	18	MacTown	249
72	Canon	230-231	153	MacWarehouse	169-177
420	Caravelle Networks	26	N/A	MacZone, The	32-39
76	Casady & Greene, Inc.	239	374	Micro Security Systems	273
147	CDA Computer Sales	161-163	179	Microcom/Carbon Copy	198
151	Central Point Software	167	132	MicroNet Technology, Inc.	47
N/A	Clarix	94-95	N/A	Microsoft	C2-C4,1
N/A	Clarix	122-123	N/A	Microsoft	183
N/A	Clarix	232	355	Microtech International	155
64	Computer Friends, Inc.	220	30	Microtek Lab, Inc.	48-49
353	Computer Video	273	150	Mirror Technologies	C5-C7
63	Connectix Corporation	101	108	Mitsubishi International Corp.	50
N/A	CoStar	184	412	Mobius Technologies, Inc.	90
N/A	CoStar	185	123	Multi-Ad Services, Inc.	31
376	Curtis Manufacturing	12	404	NEC Technologies, Inc.	139
41	Custom Applications, Inc.	18	180	NoRad	6
25	Dantz Development Corp.	225	357	Ontrack Computer Systems, Inc.	226
36	DataBased	42	N/A	Pacific Data Products	207
N/A	Dataproducts Corp.	189-192	71	Paracomp Software	24
122	Dayna	196	74	PCPC	238
159	Daystar Digital	10	139	Peachtree Software	92
163	DEC	54-55	173	PLI	201
186	Deneba Software	15	172	PLI	165
N/A	DGR Technologies	46	66	Presentation Technologies	214
17	Digital Vision, Inc.	226	68	Proxima	86-87
121	Diskette Connection	249	361	QMS, Inc.	71
135	Dr. Mac	244-245	362	QMS, Inc.	73
23	Dubl-Click	30	363	QMS, Inc.	75
170	Ehman	8-9	364	QMS, Inc.	77
44	Engineered Software	220	N/A	RasterOps	137
78	Farallon	C8	45	Salient Software	84
105	Fifth Generation Systems, Inc.	40	164	Sigma Designs	11
157	Fifth Generation Systems, Inc.	119	368	Silicon Beach	180
103	Fifth Generation Systems, Inc.	117	166	Software That Fits	258-263
155	Fifth Generation Systems, Inc.	115	85	Sophisticated Circuits	202
22	FWB, Inc.	42	197	Symantec Corporation	27
111	GCC Technologies	19	N/A	Symantec Corporation	91
112	GCC Technologies	21	99	Symantec Corporation	93
83	GCC Technologies	17	87	T/Maker	20
13	Generic	79	84	Technology Works	7
19	GeoQuery Corporation	273	417	Tektronix	204
82	Graphsoft	195	375	Texas Instruments	236-237
N/A	Hard Drives International	256	128	Third Wave Computing	257
47	Hardware Express	243	116	Timeworks, Inc.	121
N/A	Hewlett-Packard	80-81	352	Total Systems	206
N/A	Image Club Graphics, Inc.	224	175	Truevision	135
91	Information Foundation	272	191	U.S. Computer Merchants	266
130	Innovative Data Design	44	N/A	Wholesale 54	268
131	Innovative Data Design	44	356	XANTE Corporation	83
152	Insignia Solutions, Inc.	212	400	Zmac	223

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51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150
151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200
201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250
251	252	253	254	255	256	257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288	289	290	291	292	293	294	295	296	297	298	299	300
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351	352	353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384	385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400
401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480	481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500

1. Please indicate which of the following computers you currently use in your company or organization: (check all that apply)

- ☐ a) Mac Plus ☐ d) IBM PC
☐ b) Mac SE ☐ e) Other
☐ c) Mac II

2. For how many micro computers do you buy products?

- ☐ f) 1-4
☐ g) 5-49
☐ h) 50+

3. Your primary job function is: (check one)

- ☐ i) Administrative/General Management
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| <input type="checkbox"/> v) Communications | <input type="checkbox"/> 4) Communications |

5. Are you involved in the purchasing of microcomputer equipment at your company?

- ☐ 5) Yes ☐ 6) No

6. If so, what function do you serve in the buying process?

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401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416	417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448	449	450
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Pixel Paint Professional	385
Pixel Paint	226
SYMANTEC	
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SAM	65
SUM II	104
Think C 4.0	159
SYMMETRY	
Key Plan	199
Maniah	79
SYSTEMS COMPATIBILITY	
Software Bridge	69
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Magic Typist	39
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Here's what MacUser Magazine said about the CrystalPrint Express in the October 1990 issue:

"We expect the Express to live up to its name and emerge as the fastest of all PostScript® printers for both text and graphics."

CrystalPrint Express

- Super fast 12 pages per minute
- 3 Megabytes of RAM
- Dual Paper Trays
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- 6 pages per minute
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- 39 Typefaces
- Letter, Legal, Labels, Transparencies, and Envelopes

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New

CrystalPrint MacPublisher

- 6 pages per minute
- 2 Megabytes of RAM
- 39 Typefaces
- Letter, Legal, Labels, Transparencies, and Envelopes

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"The quietest of the 64 drives tested...fast—three of the twelve fastest tested were Third Wave's...and finally, 'a good bargain.'" —Macworld, March 1991.



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☒ Print the next 2 page(s) from envelope feeder

☐ Print the next page(s) from

☒ and repeat 20 times

☐ indefinitely

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What's so great about PostScript Level 2, anyway?

It's very, very fast (see chart on next page). Type characters are built 4 to 5 times faster, and text quality at small point sizes is greatly improved.

And why should I replace my old PostScript Level 1 printer now?

Existing PS Level 1 printers are on their way out. Buying a PostScript Level 1 printer today is like buying a MacPlus today — great in its time, but new technology has made it an inferior choice.

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61 sec.	100 sec.	119 sec.	241 sec.	251 sec.	301 sec.
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Street prices:
\$1995 \$3995 \$4295 \$1995 \$1749 \$1995

* Statistics are provided by MWA Research Corporation, San Jose, CA. On average, the RT Laser performed 500% faster than the Apple Personal LaserWriter. This test was based on a seven-page newsletter. The 3-column document, created in PageMaker, included halftone photos and graphics.

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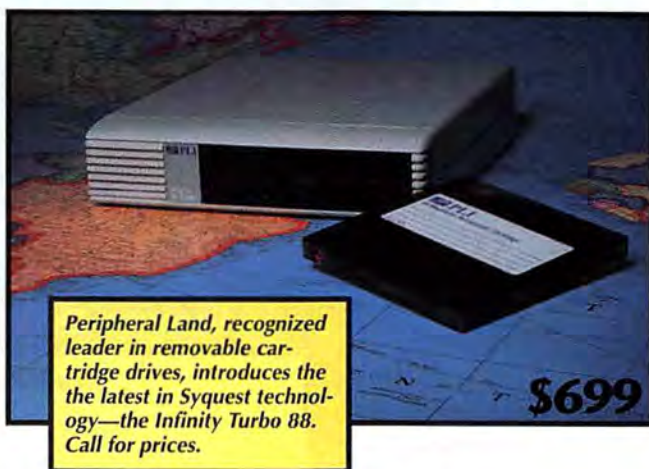
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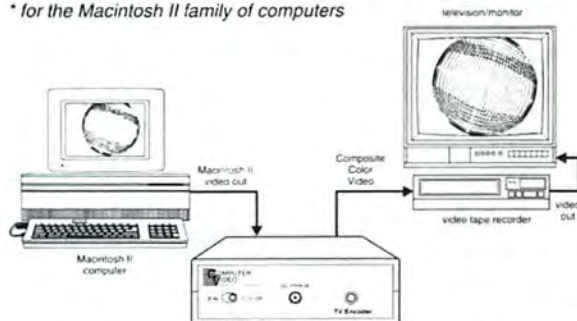
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HARDWARE 275-285

ACCELERATOR BOARDS	275
BAR CODE	275
CD-ROM	275
COMPUTER SYSTEMS	275-277
DATA ACQUISITION	277
DATA RECOVERY SERVICES	277-278
DISK DRIVES	278-280
DISKETTES	280
GENERAL	280-282
INSURANCE	282
MEMORY UPGRADES	282-283
PERIPHERALS	283-284
PRINTERS	285
SCANNERS	285

SOFTWARE 285-289

ACCOUNTING	285
BAR CODE	285
BUSINESS	285
CD-ROM	285-286
DESKTOP PUBLISHING	286
EDUCATIONAL	286
EMULATION	287
ENGINEERING	287
ENTERTAINMENT/GAMES	287
FINANCIAL	287
FONTS	287
GENEALOGY	287
GRAPHICS	287-288
HEALTH	288
LANGUAGE TOOLS	288
LOTTERY	288
MUSIC/MIDI	288
PRINT DRIVERS SPOOLERS	288
PUBLIC DOMAIN	289
SHAREWARE	289
STACKWARE	289

MISCELLANEOUS 289-291

ACCESSORIES	289
DATA CONVERSION SERVICES	289
DESKTOP PUBLISHING SERVICES	290
DISKETTE COPY SERVICES	290
FURNITURE	290
INSURANCE	290
MULTIMEDIA	290
SERVICES	290
SLIDE IMAGING SERVICES	291
SOFTWARE CONSULTING	291
SUPPLIES	291

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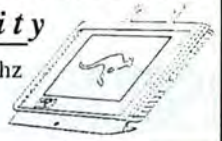
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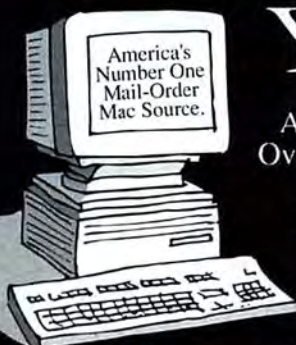
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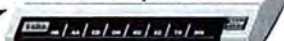


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- FreeSoft - White Knight... 94
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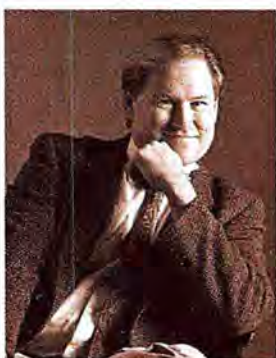
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Apple used to say that Macs cost more than PCs because they were better. Now Apple says that Macs are faster and cheaper too. Dream on, pal.



Everything looks rosy for Apple. System 7.0 seems to work and may completely fend off Windows. The lawsuit against Microsoft still looks good as I write this. Apple stock is in the stratosphere. The Classic and the LC enjoy continued success.

All this good news is supported by a recent study from Ingram Labs. It says that Macs are actually better deals than Compaq or IBM PCs if they're set to do real-world tasks. Wowie! Champagne corks are popping in Cupertino!

Ingram Labs took a slew of Compaq and IBM PCs running Windows and had them run the same kind of software that runs on the Mac — stuff like PageMaker. In all categories (based on relative CPU speed and chip type, matching a 68020 with a 286 and a 68030 with a 386/486), the Macs were faster than the PCs and turned out to be cheaper too! And the differences between the PCs and the Macs weren't even close. It was a slaughter, with the PCs costing nearly twice as much to deliver the same performance.

What a crock. Although Apple is pleased as punch, the study is seriously flawed. First of all, everyone in the world knows that the IBM and Compaq products are twice as expensive as the nearly exact same machines produced by the likes of CompuAdd, Gateway 2000, Zeos, Dell, Northgate, and dozens of other direct sellers. So the price/performance differential isn't as great as the report would have you believe. In fact, if you know how to shop in the PC world, you can probably beat Apple's prices in every category.

But this isn't where the real difference lies. I'm not even going to argue the idea that PCs with Windows are similar to Macs. They aren't. I may be a prejudiced user and a professional nay-sayer, but it's hard to honestly suggest that Windows is even close to the Apple OS in functionality.

I always tell Windows users that when they can install a program or printer or whatever into their system merely by clicking on an icon and dragging it into the system folder, *then* (and only then) will they have achieved something worth bragging about. At this point, they aren't even close.

Even more interesting is that the Apple system is so forgiving. There is no way you can junk up a PC with needless garbage and have the machine function. With the Mac, if you look into anyone's System Folder, you end up finding all sorts of junk (memos even!)

that shouldn't be in there. Somehow they got included by accident or through carelessness.


Simply put, the Apple OS is built with GUI in mind and is probably the best operating system ever built for the personal computer. The coders who Steve Jobs whipped into programming this thing and the people who maintain it should get some sort of medal.

But for sheer speed, the Mac with all its whiz-bangery still can't outperform the PC, because most PC users stick with the high-performance, albeit archaic, command-line interface. You tell the machine what to do, and off it goes. This is why Intel chips appear to outperform Motorola's in real-world tasks. In theory the chips are closely matched, but Motorola-based systems always have a pile of overhead — either the Mac OS or UNIX — to bog them down.

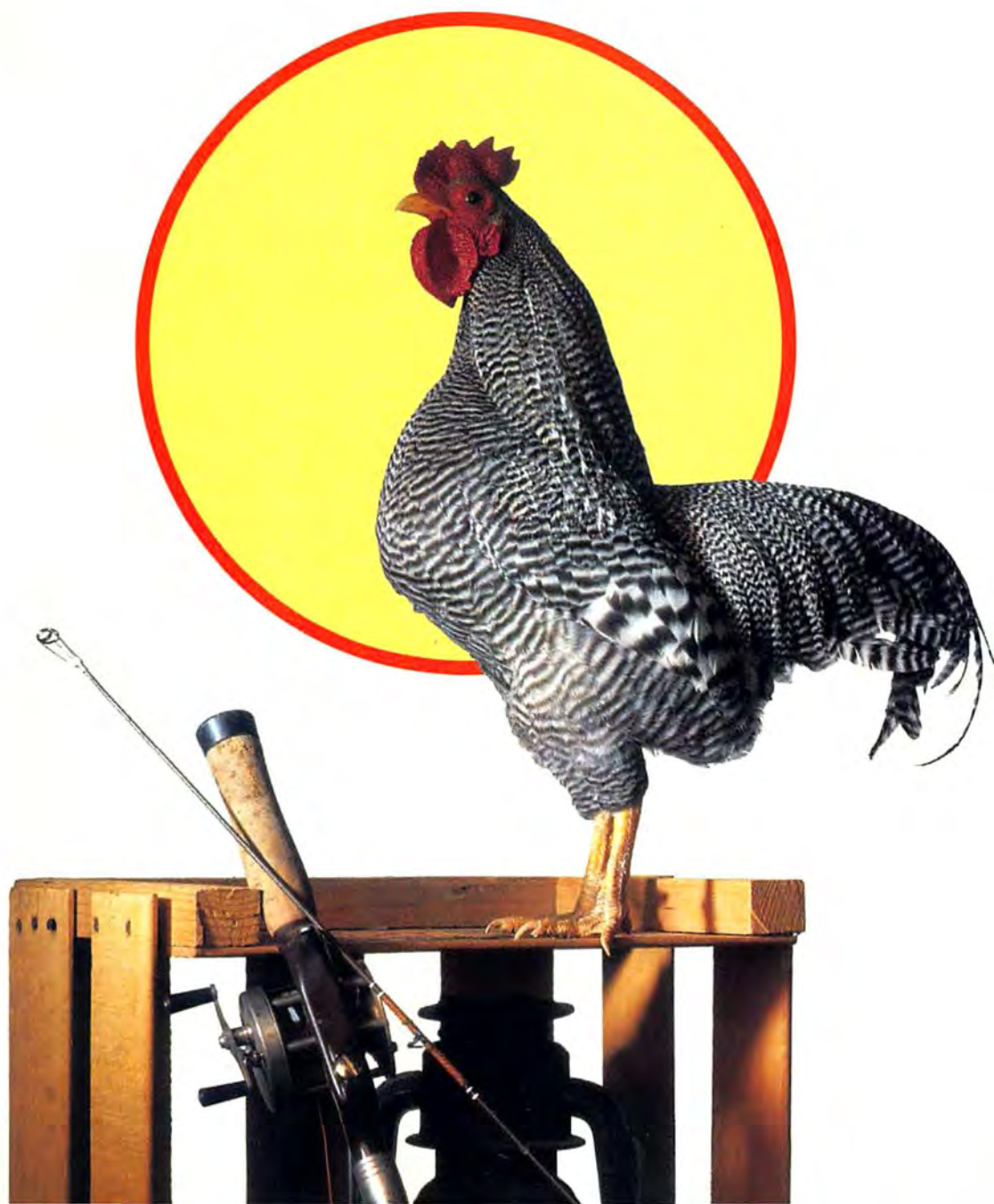
The personal-computer revolution evolved from a bare-bones rocket-sled mentality. Apple DOS (on the Apple II), CP/M, and Northstar DOS were the original operating systems. They were lean and mean program loaders and control programs that made sure keyboards and printers worked properly and that a disk could be read. Nothing fancy. The operating system was there just to help programs talk to users. Programs were the be-all, end-all. This hasn't changed one bit in 15 years. MS-DOS is merely a clone of CP/M. Programs still matter more than the OS.

Along came the Lisa — then the Mac — with a new paradigm straight from the heart of the Xerox Star computer. The new paradigm was the desktop. It was alien to the primary trend in desktop/personal computers: minimalism.

I have yet to see any indication that this has changed. The flop of OS/2 offers some proof that the trend remains. Until Windows 3.0, it looked bad for Windows too. Since the Windows 3.0 rollout, interest in complex environments has perked up a bit, but there is no proof that it will last. Windows applications are slow in coming, and who's making money? Just Microsoft.

So everything looks good for the Mac, does it? The Mac is better? Well, maybe we should be honest and look at the Mac versus a PC clone running raw DOS and see what we think. I think Apple is beaten in each category if we look at raw performance *and* price/performance. The Ingram Labs report may help stave off Windows — but not the plain-vanilla PCs of the world. 

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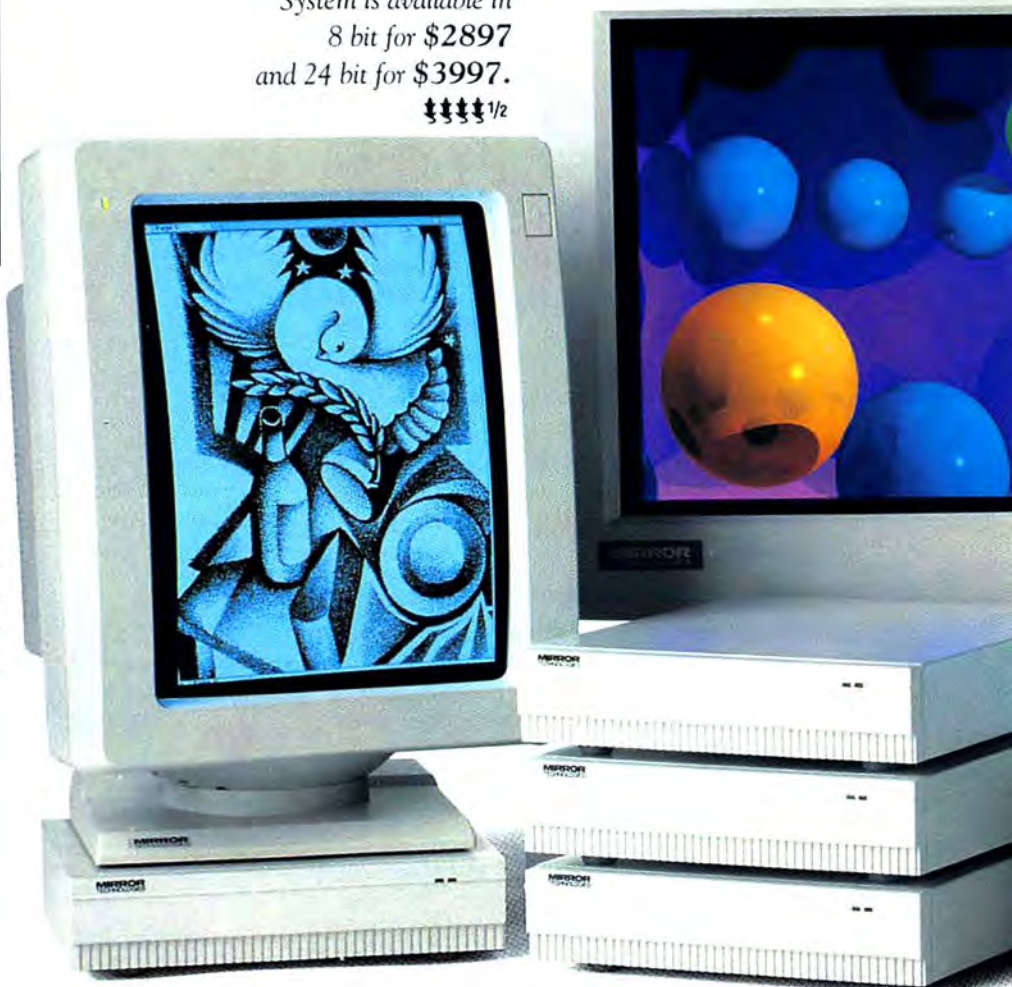
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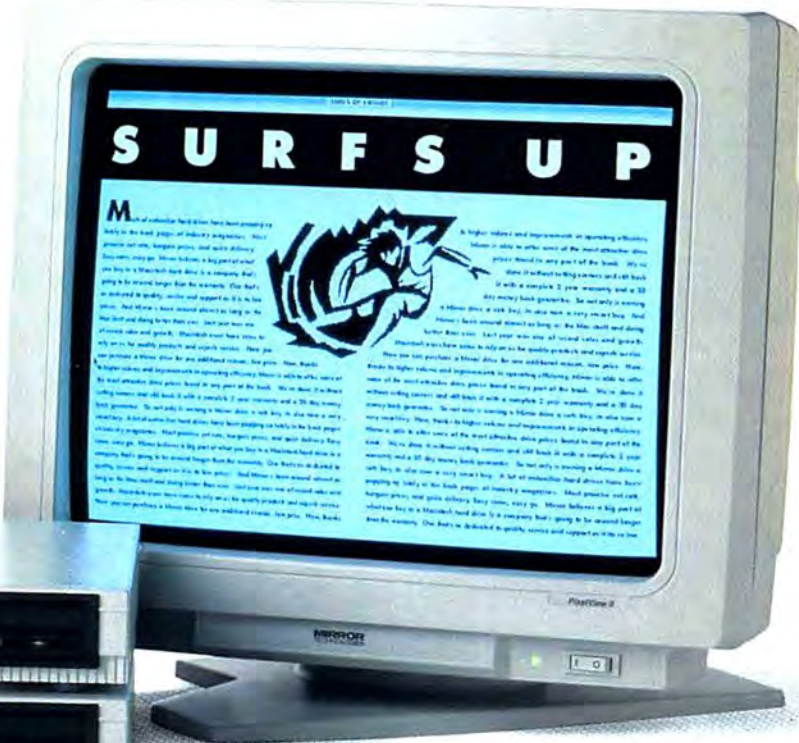
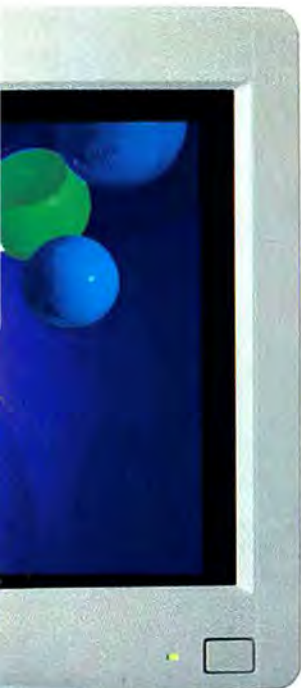
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